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Graduates of Higher Education in the Food and Agricultural Sciences

Volume III — Sex, Race, and Ethnicity Characteristics of Students and Graduates and of Food and Agricultural Professionals [illegible]

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Volume III—Sex, Race, and Ethnicity Characteristics of Students and Graduates and of Food and Agricultural Professionals

By Kyle Jane Coulter and Marge Stanton

January 1983

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ACKNOWLEDGMENTS

Graduates of Higher Education in the Food and Agriculture Sciences: Volume III -- Sex, Race, and Ethnicity of Students/Graduates and of Food and Agricultural Professionals was prepared by the Office of Higher Education, Agricultural Research Service (ARS), U.S. Department of Agriculture (USDA). Kyle Jane Coulter, Deputy Director, Office of Higher Education, was coordinator of the Manpower Assessment Project which served as a basis for this report.

Within USDA, many individuals contributed to the project. Lark Carter and, subsequently, Allan Goecker served as Director, Office of Higher Education, and thus gave administrative support. Marge Stanton, Communications and Data Services Division, Agricultural Research Service, was responsible for processing and analyzing most of the data. Curtiland Deville and Louise Ashton, Equal Opportunity Staff, Extension Service, provided assistance in accessing employment data for the Federal Government. James Gardner and Elizabeth Bellah, Office of Higher Education, provided assistance with data processing and editing.

Data used in the project were made available by the National Center for Education Statistics, the Bureau of Labor Statistics, the American Vocational Association, the Association of American Colleges of Veterinary Medicine, the Department of Defense, and the USDA Extension Service. A USDA-funded Clemson University project, directed by Stephen R. Chapman and Edward L. McLean, was responsible for collecting and summarizing the data on race and ethnicity of students enrolled in the food and agricultural sciences and the employment data on college and university faculty.

Program Resources, Inc. (PRI) assisted with development of the overall project design and processed and summarized much of the employment data. Representing PRI were David Lipstein and Jane Burgess.

Providing continuing guidance and direction throughout the project was a panel of consultants representing the Resident Instruction Section, Division of Agriculture, National Association of State Universities and Land-Grant Colleges. Members of the panel were Edward Glazener (Chair), Stephen Chapman, Allan Goecker, and Winston Pullen.

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Graduates of Higher Education in the Food and Agricultural Sciences:

Volume III—Sex, Race, and Ethnicity Characteristics of Students and Graduates and of Food and Agricultural Professionals

Kyle Jane Coulter and Marge Stanton*

CHAPTER I

INTRODUCTION

Purpose of Study

A 1980 study completed by the U.S. Department of Agriculture, Agriculture Research Service, Office of Higher Education provided an analysis of the current and projected supply of graduates of higher education in the food and agricultural sciences and the occupational employment demand for such graduates. The results of this study produced empirical evidence that the Nation will be facing significant shortages of scientific and professional food and agricultural expertise over the next decade (for example, agricultural engineering, food sciences, agricultural business and management, molecular biology, and plant and animal genetics).

Other academic disciplines are competing increasingly with the food and agricultural sciences for students. Therefore, it is important that the food and agricultural sciences focus recruitment efforts on the full spectrum of potential students. Two particular categories of potential students which appear to warrant special consideration are females and minorities. Growing numbers of both females and minorities are earning college degrees and are participating in the professional labor force. For example:

- A striking phenomena of the postwar era has been the increasing participation of women in higher education. In 1950, women received only one-fourth of all baccalaureate and first-professional degrees, but almost one-half of such degrees in 1980. In science and engineering (S/E) fields, the share of degrees earned by women remains less than those in non-S/E fields. However, they increased at a faster rate -- from 12 percent in 1950 to 36 percent in 1980.[1]

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[1] "Trends in Science and Engineering Degrees, 1950 through 1980," Science Resources Studies Highlights. National Science Foundation, October 7, 1981, p. 2.

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- In 1975 women represented 46 percent of the labor force; they are projected to constitute 56 percent in 1985, 60 percent in 1990, and 61 percent in 1995.[2]

- Minorities have increased their share of all academic degrees, earning almost 11 percent of all Ph.D.'s awarded in the United States in 1979.[3]

- Minorities comprised 8.5 percent of all U.S. professionals and technical workers in 1979.[3] Furthermore, the black labor force is growing at about twice the rate of that for whites.[2]

In essence, both females and minorities represent important sources of human capital which should be developed to meet the Nation's future scientific and technical needs. It is generally recognized that females and minorities are increasingly electing to prepare for and pursue scientific and professional food and agricultural careers. To date, however, there has been no coordinated effort to conduct a national assessment of the extent to which these two segments of the population constitute students and graduates in the various disciplines comprising the food and agricultural sciences. Likewise, there has been no previous national assessment of the extent to which females and minorities are employed in scientific and professional food and agricultural occupations. In keeping with the designation of the U.S. Department of Agriculture as the "lead agency of the Federal Government for agricultural research, . . . extension, and teaching in the food and agricultural sciences" and the Secretary's responsibility for keeping informed of the Nation's need for "manpower development in the food and agricultural sciences" (as stated in Public Law 97-98), this study was undertaken to investigate demographic characteristics relative to the supply of and demand for graduates of higher education in the food and agricultural sciences. The demographic characteristics studied were sex, race, and ethnicity.

Methodology

In conducting the study, the Office of Higher Education relied extensively on a panel of university consultants representing the Resident Instruction Section of the Division of Agriculture, National Association of State Universities and Land-Grant Colleges. Appendix 1 lists the members of the panel of consultants. Consensus from this panel was utilized to:

1. identify baccalaureate and higher degree specializations leading to food and agricultural expertise,

2. estimate the percent of graduates in the various degree specializations qualified for employment as food and agricultural scientists and professionals,

3. identify industries and occupations employing workers with food and agricultural expertise,

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[2] Fullerton, Howard N. Jr., "The 1955 Labor Force: A First Look," Monthly Labor Review. Vol. 103, No. 12. Bureau of Labor Statistics, U.S. Department of Labor, 1980, p. 15.

[3] "Women and Minorities in the Sciences," Manpower Comments. Vol. 18, No. 2. Scientific Manpower Commission, March, 1981, p. 18.

4. estimate the percent of employed workers in specific occupations within the different industry sectors who possess higher education in the food and agricultural sciences,

5. develop a degree-occupation matrix relating expertise acquired via given degree specializations to that desirable for employment in given occupations,

6. analyze and interpret the findings and results of the study.

Additionally, the panel of consultants provided the necessary expertise to develop a single analytical model which would facilitate integrating multiple data bases.

Identification of Demographic Characteristics of Students and Graduates in the Food and Agricultural Sciences

1. Utilization of the Higher Education General Information Survey (HEGIS)

HEGIS is a series of annual and periodic surveys conducted by the National Center for Education Statistics (NCES), U.S. Department of Education (DOED). HEGIS data are collected from all accredited public and private colleges and universities granting associate or higher degrees. The results of this data collection process provide comprehensive figures classifying graduates of higher education degree programs by level of degree, discipline division, degree specialization, and sex of student.

While HEGIS provides a comprehensive, standard set of data on academic degrees conferred by all U.S. colleges and universities, only selected degrees lead to expertise in the food and agricultural sciences. To determine relevant academic degrees, the panel of consultants was asked to identify HEGIS degree specializations that result primarily in expertise in the food and agricultural sciences. The panel selected 31 HEGIS degrees as the nucleus of the food and agricultural sciences.

For each of the degree specializations selected, the panel estimated the percent of graduates at each degree level (baccalaureate, master's, doctoral) qualified for scientific or professional employment related to food or agriculture. Of the 31 degree specializations selected by the panel, all graduates were deemed qualified for food or agricultural employment with the exception of those in five degree specializations. These five degree specializations and the percent of graduates deemed qualified for food or agricultural professional employment as estimated by the panel were as follows:

Percent of Graduates Qualified for Employment in the Food and Agricultural Labor Force

Degree Specialization	Baccalaureate	Master's	Doctoral
Landscape Architecture	30	10	not applicable
Plant Physiology	50	50	75
Biochemistry	25	10	10
Marine Biology	15	15	15
Entomology	80	75	50

HEGIS data for the 1978/79 academic year were used to identify numbers of male and female graduates in the degree specializations cited by the panel of consultants as leading to scientific and professional expertise in food and agriculture. These were the most current national data available at the time the study was initiated.

Because HEGIS collects data on race and ethnicity of graduates only on a biennial basis and only for broad fields (for example, Agriculture and Natural Resources in the aggregate), it was necessary to obtain race and ethnicity data from another source. The best source of these data proved to be a 1979/80 USDA-funded Clemson University survey of students and faculty in higher education in the food and agricultural sciences.

One weakness of HEGIS data is the tendency of institutional respondents to report graduates as recipients of a general degree (for example, general agriculture) when such graduates have actually completed a specialization in a specific discipline (for example, agricultural economics). To adjust HEGIS data to more accurately reflect graduates with specialized expertise as opposed to generalist expertise, the panel of consultants estimated the latter. The remainder of recipients of general degrees were distributed across the specific degree specializations within the appropriate discipline divisions.

2. Utilization of the Clemson University Survey

Clemson University conducted an extensive survey for the 1979/80 academic year of all known college and university programs at the baccalaureate and higher degree levels in agriculture and natural resources, forestry, veterinary medicine, and home economics. The survey produced detailed information on the minority status of students, by level of enrollment in the food and agricultural sciences. The taxonomy of educational programs used in the Clemson University survey to collect data on student enrollment in the food and agricultural sciences differed slightly from the HEGIS taxonomy. Therefore, the panel of consultants was asked to provide guidance in developing a crosswalk to relate the two taxonomies (appendix 2). This procedure made it possible to analyze and interpret the Clemson University data in a format comparable to that used by HEGIS.

3. Utilization of Additional Sources of Data

Three additional sources were used to access data on students and graduates not included in the HEGIS or Clemson University surveys. These were as follows:

- Professional Personnel Recruitment Committee, Agriculture Education Division, American Vocational Association--data on baccalaureate graduates in agricultural education
- National Research Council, National Academy of Sciences--data on doctoral graduates in agricultural education
- Association of American Veterinary Medical Colleges--data on students enrolled in programs leading to the degree of Doctor of Veterinary Medicine.

Identification of Demographic Characteristics of Workers in Food and Agricultural Occupations

A comprehensive data base does not exist that covers the full spectrum of specific employment in food and agricultural occupations. Therefore, this study used an innovative, experimental methodology to develop estimates of the number of workers by occupation likely to require higher education in the food and agricultural sciences. The following discussion provides an overview of the process used to identify current and projected levels of employment and demographic characteristics of workers in food and agricultural occupations.

1. Utilization of Occupational Employment Statistics (OES)-Census Data

The Bureau of Labor Statistics (BLS) OES-census based matrix system produces tabular presentations of current and projected employment statistics cross-classified by industry and occupation. These national tables or matrices are based on concepts and classification systems used in the 1970 Census of Population. The matrix system can be used to estimate future occupational job openings by using data from a base-year matrix, a projected-year matrix, and job-separation rates developed from decennial census data and working-life tables. The national matrices have been used as tools for policy decisions as well as aids to develop State and area occupational employment projections.

a. Selection of OES-census occupations--The consultants reviewed a complete listing of OES-census occupations. From this list they selected 52 occupations for which all or some workers are likely to require higher education in the food and agricultural sciences. The list of selected OES-census occupations is presented in appendix 3.

b. Selection of OES-census industries--The consultants also reviewed a complete listing of OES-census industries and identified 119 industries as likely to employ persons with higher education in the food and agricultural sciences. The list of selected OES-census industries is presented in appendix 4.

c. Development of an industry-occupation (I-O) matrix--The industries and occupations selected by the consultants were arranged in a matrix format. All selected occupations were listed under each selected industry.

d. Estimation of percent of workers likely to possess higher education in the food and agricultural sciences--For each industry, the consultants examined the number of workers employed in each occupation and estimated the percent deemed to possess higher education in the food and agricultural sciences. For example, it was estimated that 10 percent of the agricultural and biological technicians in the dairy products industry possess food or agricultural training.

e. Computation of current and projected food and agricultural occupational employment--Occupational employment for 1976 was used as the base year and 1985 was used as the projection year for the study. For each selected industry, the percent of workers in a given occupation estimated as possessing higher education in the food and agricultural sciences was multiplied by the 1976 and 1985 employment levels. Employment in each occupation was then summed across all selected industries to determine the total number of food and agricultural professionals in a given occupation.

2. Utilization of Current Population Survey Data

The OES program does not provide demographic characteristics relative to employment data. However, the BLS Current Population Survey (CPS) program does collect occupational employment data by sex, race, and ethnicity. Similar to OES-census based data, CPS data are based on decennial census concepts and taxonomy. BLS has maintained a historical series of these data since 1972. Ratios from unpublished CPS data were applied to levels of occupational employment derived from OES-census data to compute the number of individuals within each racial/ethnic and gender category in a given occupation.

3. Utilization of Additional Sources of Employment Data

Despite the comprehensive nature of the OES-census and the CPS data bases, both lack detailed information on three particular categories of food and agricultural employment. For this reason, supplementary sources of employment data used were as follows:

a. Office of Vocational and Adult Education, Department of Education--sex, race, and ethnicity data on secondary and postsecondary vocational agriculture teachers,

b. Clemson University Survey of Students and Faculty in Higher Education in Food and Agriculture -- data on college and university faculty employment,

c. USDA, Science and Education, Extension Service--data on professional workers in the States' Cooperative Extension Services.

Because both the Federal Government and the Armed Services have a broad range of positions and occupations which frequently require food and agricultural expertise, two additional sources of data were used to facilitate further analysis of employment of food and agricultural professionals. Data on Armed Services military officers and enlisted personnel in specific duty positions were obtained from the Defense Manpower Data Center, Department of Defense (DOD). Data on Federal full-time professional workers in occupation series frequently requiring food and agriculture expertise were obtained from the U.S. Office of Personnel Management (OPM).

In analyzing both DOD and OPM employment data, no effort was made to estimate the percent of workers in a given occupation possessing higher education in the food and agricultural sciences. The specificity of DOD and OPM occupational titles, which allows for more precise selection of occupation, lessened the need for such estimates.

Identification of Relationships Between Degree Specializations and Occupational Employment

One of the most important components of this particular study was the identification of relationships between educational programs and occupational employment. The relationships between degree specializations and occupational employment are complex for higher education graduates. Furthermore, little empirical information exists at the national level on the specific placement of higher education graduates in the food and agricultural sciences. Therefore, the project consultants examined data from a variety of placement studies (such as State, regional, and professional associations). This review, synthesized with the professional expertise of the panel, resulted in identification of degree-occupation relationships via a matrix format.

Recognizing the fact that level of education significantly influences associations between degree specializations and occupational employment, the panel developed three degree-occupation matrices. These matrices denote degree-occupation relationships at the baccalaureate level, the master's level, and the doctoral level.

In developing the degree-occupation matrices, the panel relied primarily on three major criteria: historical placement patterns as reflected by the limited available data; objectives of a given degree curriculum with regard to career preparation; and competencies required for entry into a given occupation. The three degree-occupation matrices developed by the panel are presented in figures 1-3 in chapter II.

Presentation of Findings

Organization of Findings

Findings stemming from the study are presented in chapters II through VII. Specifically, each chapter addresses the following:

Chapter II

- Relationships between competencies acquired via given degree specializations and occupational employment
- Enrollment and degrees conferred in the food and agricultural sciences
- Food and agricultural occupational employment

Chapter III

- Degrees conferred data classified by sex of graduates and occupational employment data classified by sex of workers
- Occupational employment trends as related to sex of workers

Chapter IV

- Enrollment data classified by minority status of students and occupational employment data classified by minority status of workers
- Occupational employment trends as related to minority status of workers

Chapter V

- Summary of students and graduates in the food and agricultural sciences

- Summary of occupational employment data classified by sex and by minority status of workers

Chapter VI

- Military personnel and Federal professional employment data classifed by sex and minority status.

Interpretation Guidelines

Much of the complexity of the study resulted from the fact that many data bases were required to analyze the sex, race, and ethnicity of students or graduates in the food and agricultural sciences and of food and agricultural professionals in the labor force. Further difficulty was introduced by the fact that these data bases were developed prior to the study by different agencies and organizations. As such, they were originally developed to serve different purposes and to denote different time periods. Therefore, attention is called to the several restrictions and limitations associated with the various data bases. A summary of these restrictions and limitations follows to better help the reader clarify anomalies in the data and interpret the findings.

1. Foreign students/graduates are included in both HEGIS data on degrees conferred and Clemson University enrollment data. Other NCES data indicate that for the 1978/79 academic year more than 2 percent of the baccalaureate, 13 percent of the master's, and 28 percent of the doctoral degrees in agriculture and natural resources were earned by nonresident aliens. Additionally, data from the Institute of International Education reveal that for the 1980/81 academic year, almost 9,000 foreign students were enrolled in agriculture and natural resources.[4]

   At the time this study was conducted, no data existed for identifying foreign students by degree specialization nor for subtracting the numbers of foreign graduates from prospective entrants into the American labor force. Therefore, the data on enrollment and degrees conferred presented in this report are inflated by a considerable number, particularly at the advanced degree level.

2. Discrepancies may be noted in the ratio of enrollment to degrees conferred for some of the degree specializations (such as biochemistry, marine biology, scientific nutrition, natural resources management, and park and recreation management). These discrepancies are caused by a variety of factors. One, the HEGIS data on degrees conferred were collected by NCES and represent the total spectrum of U.S. colleges and universities, without regard to institutional administrative structure. Therefore, all degrees conferred in such specializations as biochemistry, marine biology, and others were reported by an institution regardless of the college or school awarding the degrees.

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[4] Boyan, Douglas R., Alfred C. Julian, and Judith Rew, Open Doors; 1980/81--Report on International Educational Exchange. Institute of International Education, 1981, p. 16.

Enrollment data were collected by Clemson University from all known institutions with programs in agriculture, natural resources, forestry, veterinary medicine, and home economics. The Clemson University survey requested administrators of these programs to also obtain and report enrollment data for food and agricultural degree specializations frequently administered outside their colleges or schools (such as agricultural engineering, agricultural education, biochemistry, marine biology, and scientific nutrition). Many survey respondents, however, failed to report such data. Furthermore, many colleges and universities which do not have a college/school of agriculture/natural resources, forestry or veterinary medicine offer degrees in such specialties as marine biology, scientific nutrition and biochemistry. These institutions, however, were not included in the Clemson University survey.

Two, another factor relating to discrepancies between data on degrees conferred and on enrollment is that of differing taxonomies of educational programs. The taxonomy used for the Clemson University survey differed slightly from the HEGIS taxonomy. Therefore, data on enrollment was not always reported in a manner consistent with that on degrees conferred.

3. Definitions for minority and nonminority status differ slightly among the various data bases used in the study. Hence, caution is advised with regard to reviewing the actual data and footnotes specific to each statistical table presenting racial and ethnic information.

4. Large percentage changes in the employment trend data may be artifacts of small numbers representing employment in given occupations.

5. CPS data, which were used as the basis for classifying employment by sex, race, and ethnicity, represent sample statistics collected via monthly enumeration of 65,000 occupied units. Because of the small sample size, CPS employment data for occupations with less than a total of 35,000 workers (such as agricultural scientist, veterinarian, life and physical scientist, and marine scientist) are less reliable than are data for occupations with a larger number of total workers.

CHAPTER II

STATISTICAL OVERVIEW

The purpose of this chapter is to provide an introductory overview of students and graduates in the food and agricultural sciences and of workers employed in food and agricultural occupations. The chapter contains figures and tables which identify relationships between food and agricultural degree specializations and occupations, numbers of students and graduates by degree level, and levels of employment in food and agricultural occupations.

Figures 1-3 show the relationships between degree specializations and occupational employment. Figure 1 identifies degree-occupation relationships at the baccalaureate level; figure 2, at the master's; and figure 3, at the doctoral level. As may be noted in the three matrices, many occupations require expertise which can be acquired via a broad spectrum of degree specializations (such as agricultural or biological technician, manager or administrator, public official or administrator, agricultural scientist, sales manager or worker, editor or reporter). Other occupations require expertise specific to a limited number of degree specializations, (such as engineer, dietitian, veterinarian, or chemist)

Tables 1 and 2 present an overview of degrees conferred and enrollment in specializations comprising the food and agricultural sciences. Statistics are provided by degree level and in total. Table 3 provides employment statistics for food and agricultural occupations. Total employment cited for a given occupation includes only those workers in the occupation deemed to possess food or agricultural expertise. Percent of total workers in an occupation denotes the percent of all workers in the occupation, across all industries, deemed to possess food or agricultural expertise.

Figure 1

Degree/Occupation Matrix for Baccalaureate Graduates in Food and Agricultural Specializations

OES-Census-Occupation Degree	1. Adult educators	2. Agricultural and biological technicians (except health)	3. Agricultural scientists	4. Architects (landscape)	5. Assessors, controllers, treasurers (local public administration)	6. Bank officers and financial managers	7. Buyers (wholesale and retail trade)	8. Buyers and shippers (farm products)	9. Chemical technicians	10. Chemists	11. Civil engineers	12. Cooperative Extension Services personnel	13. Credit and collection managers	14. Dietitians	15. Economists	16. Editors and reporters	17. Engineers, nec (agricultural engineers)	18. Estimators and investigators, nec	19. Expediters and product controllers	20. Farm management advisers (except Extension personnel)	21. Farm managers	22. Farmers (owners and tenants)	23. Food service workers, nec (except private)	24. Foresters and conservationists	25. Gardeners and groundskeepers (except farm)	26. Health aides (except nursing)	27. Health technicians/technologists, nec	28. Industrial engineers	29. Inspectors (public administration -except construction)	30. Inspectors, scalers, and graders (log and lumber)	31. Insurance adjusters, examiners, and investigators	32. Insurance agents, brokers, and underwriters
1. Agriculture, general			■		■	■	■	■				■	■			■		■		■	■	■			■				■		■	■
2. Agricultural business			■		■	■	■	■				■	■		■			■		■	■	■							■		■	■
3. Agricultural economics			■		■	■	■	■				■	■		■			■		■	■	■							■		■	■
4. Agricultural education	■											■								■												
5. Agricultural engineering		■	■								■	■					■											■			■	
6. Agriculture and farm management			■		■	■	■	■				■	■		■			■		■	■	■									■	■
7. Agriculture and forest technologies		■	■				■	■				■							■	■				■					■	■	■	
8. Agronomy		■	■				■	■				■								■	■	■							■		■	
9. Animal science		■	■				■	■				■															■		■		■	
10. Biochemistry		■							■	■																	■					
11. Dairy science		■	■				■	■				■								■	■	■					■		■		■	
12. Entomology		■	■									■								■									■		■	
13. Fish, game, wildlife management		■	■									■								■	■	■		■			■				■	
14. Food science technology		■					■	■		■									■								■		■			
15. Foods and nutrition		■					■					■		■									■			■	■		■			
16. Forestry		■	■		■	■	■	■				■						■		■	■	■		■					■	■	■	
17. Horticulture, fruit and vegetable		■	■				■	■				■								■	■	■			■				■		■	
18. Horticulture, ornamental			■	■			■	■				■									■	■			■				■		■	
19. Institution and cafeteria management							■							■									■				■		■			
20. Landscape architecture				■																												
21. Marine biology		■																						■			■				■	
22. Natural resources management		■										■						■						■			■				■	
23. Nutrition, scientific		■								■		■		■												■	■		■			
24. Parks and recreation management				■								■												■	■							
25. Plant pathology		■	■									■								■									■		■	
26. Plant physiology		■																														
27. Poultry science		■	■				■	■				■								■	■	■					■		■		■	
28. Range management		■	■									■						■		■	■	■		■					■		■	
29. Soil science		■	■		■							■						■		■	■	■		■								
30. Veterinary medicine (pre-professional)		■	■						■	■		■															■		■			
31. Other (Agricultural communications/journalism)												■				■																

☐ Degree program generally does not prepare student for occupation.

■ Degree program generally prepares student for occupation.

nec = not elsewhere classified.

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14. Dietitians
15. Economists
16. Editors and reporters
17. Engineers, nec (agricultural engineers)
18. Estimators and investigators, nec
19. Expediters and product controllers
20. Farm management advisers (except Extension personnel)
21. Farm managers
22. Farmers (owners and tenants)
23. Food service workers, nec (except private)
24. Foresters and conservationists
25. Gardeners and groundskeepers (except farm)
26. Health aides (except nursing)
27. Health technicians/technologists, nec
28. Industrial engineers
29. Inspectors (public administration –except construction)
30. Inspectors, scalers, and graders (log and lumber)
31. Insurance adjusters, examiners, and investigators
32. Insurance agents, brokers, and underwriters
33. Managers and administrators, nec
34. Marine scientists
35. Mechanical engineers
36. Officials and administrators, nec (public administrators)
37. Purchasing agents and buyers, nec
38. Real estate agents and brokers
39. Real estate appraisers
40. Recreation workers
41. Restaurant, cafeteria, and bar managers
42. Sales managers and department heads (retail)
43. Sales managers (except retail)
44. Sales workers and sales clerks, nec
45. Secondary/post-secondary vocational agriculture teachers
46. Statisticians
47. Stock and bond sales agents
48. Surveyors
49. Urban and regional planners

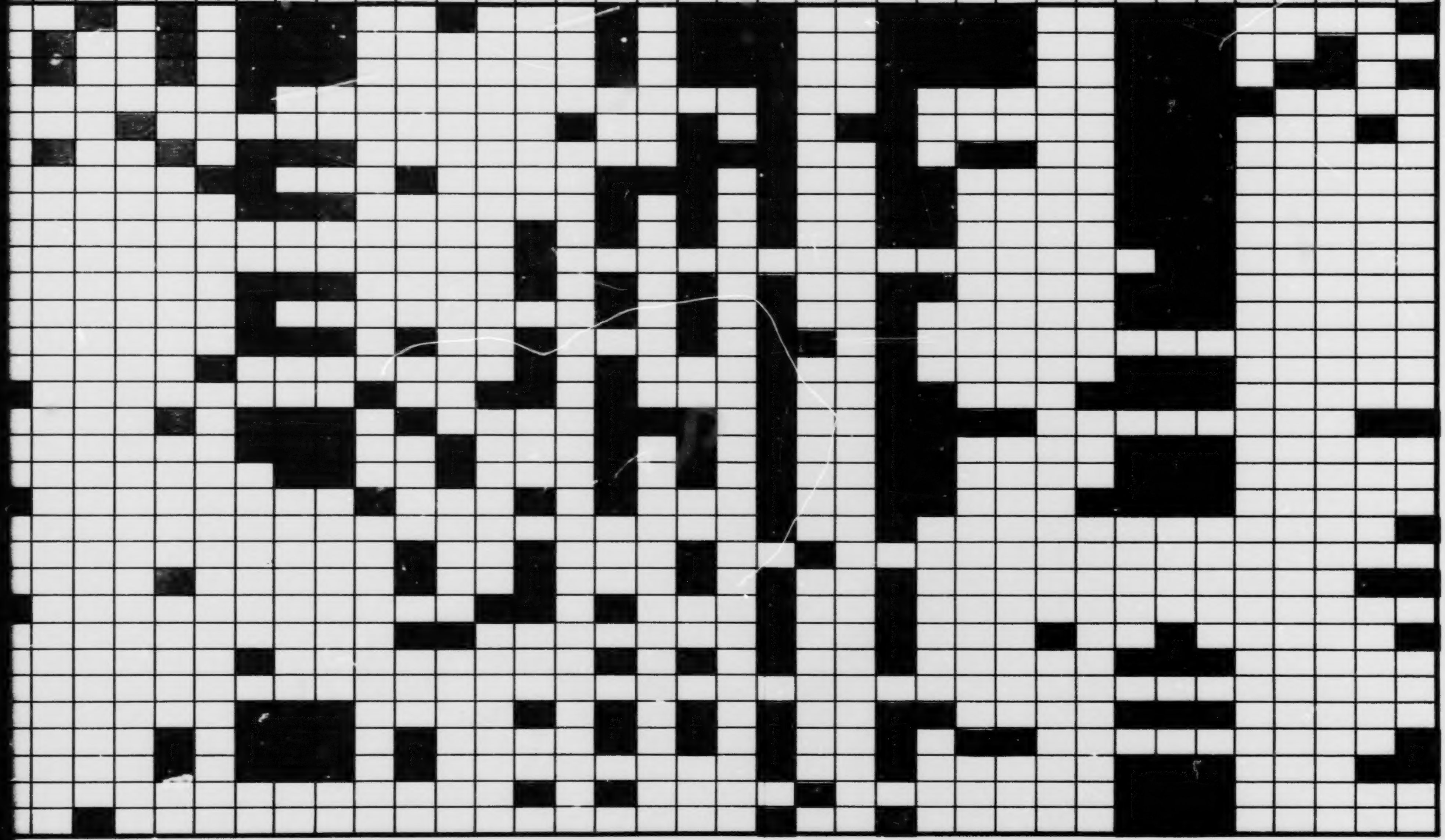

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Figure 2

Degree/Occupation Matrix for Master's Graduates in Food and Agricultural Specializations

Degree \ OES-Census-Occupation	1. Adult educators	2. Agricultural scientists	3. Architects (landscape)	4. Assessors, controllers, treasurers (local public administration)	5. Bank officers and financial managers	6. Biological scientists	7. Buyers (wholesale and retail trade)	8. Buyers and shippers (farm products)	9. Chemists	10. Civil engineers	11. College and university faculty	12. Cooperative Extension Services personnel	13. Credit and collection managers	14. Dietitians	15. Economists	16. Editors and reporters	17. Engineers, nec (agricultural engineers)	18. Estimators and investigators, nec	19. Expediters and product controllers	20. Farm management advisers (except Extension personnel)	21. Farm managers	22. Farmers (owners and tenants)	23. Foresters and conservationists	24. Gardeners and groundskeepers (except farm)	25. Health technicians/technologists, nec	26. Industrial engineers	27. Inspectors (public administration -except construction)	28. Inspectors, scalers, and graders (log and lumber)	29. Insurance adjusters, examiners, and investigators	30. Insurance agents, brokers,
1. Agriculture, general		■		■	■	■	■	■				■	■			■		■		■	■	■		■			■		■	■
2. Agricultural business		■		■	■		■	■				■	■		■	■		■	■	■	■	■					■		■	■
3. Agricultural economics		■		■	■		■	■				■	■		■	■		■	■	■	■	■					■		■	■
4. Agricultural education	■	■										■				■				■										
5. Agricultural engineering		■								■		■				■	■		■	■						■			■	
6. Agriculture and farm management		■		■	■							■	■		■	■		■		■	■	■							■	■
7. Agriculture and forest technologies		■				■						■				■			■	■	■	■	■				■	■	■	
8. Agronomy		■				■						■				■				■	■	■					■		■	
9. Animal science		■				■						■				■				■	■	■			■		■		■	
10. Biochemistry		■				■			■			■				■			■						■		■			
11. Dairy science		■				■						■				■				■	■	■			■		■		■	
12. Entomology		■				■			■			■				■				■							■		■	
13. Fish, game, wildlife management		■				■						■				■					■	■	■		■				■	
14. Food science technology		■				■			■			■				■			■						■		■			
15. Foods and nutrition		■				■	■		■			■		■		■			■						■		■			
16. Forestry		■		■	■	■						■				■			■	■	■	■	■				■	■	■	
17. Horticulture, fruit and vegetable		■				■						■				■					■	■		■			■		■	
18. Horticulture, ornamental		■				■						■				■					■	■		■			■		■	
19. Institution and cafeteria management							■					■		■		■											■			
20. Landscape architecture		■	■								■	■				■														
21. Marine biology		■				■						■				■							■		■				■	
22. Natural resources management		■				■						■				■							■		■				■	
23. Nutrition, scientific		■				■			■			■		■		■									■		■			
24. Parks and recreation management		■										■				■							■	■						
25. Plant pathology		■				■						■				■				■							■		■	
26. Plant physiology		■				■			■			■				■														
27. Poultry science		■				■						■				■				■	■	■			■		■		■	
28. Range management		■				■						■				■				■	■	■	■				■		■	
29. Soil science		■		■					■			■				■		■		■	■	■	■		■					
30. Veterinary medicine (pre-professional)		■				■			■			■							■						■		■			
31. Other (Agricultural communications/journalism)												■				■														

☐ Degree program generally does not prepare student for occupation.
■ Degree program generally prepares student for occupation.
nec = not elsewhere classified.

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13. Credit and collection managers
14. Dietitians
15. Economists
16. Editors and reporter.
17. Engineers, nec (agricultural engineers)
18. Estimators and investigators, nec
19. Expediters and product controllers
20. Farm management advisers (except Extension personnel)
21. Farm managers
22. Farmers (owners and tenants)
23. Foresters and conservationists
24. Gardeners and groundskeepers (except farm)
25. Health technicians/technologists, nec
26. Industrial engineers
27. Inspectors (public administration -except construction)
28. Inspectors, scalers, and graders (log and lumber)
29. Insurance adjusters, examiners, and investigators
30. Insurance agents, brokers, and underwriters
31. Managers and administrators, nec
32. Marine scientists
33. Mechanical engineers
34. Officials and administrators, nec (public administrators)
35. Purchasing agents and buyers, nec
36. Real estate agents and brokers
37. Real estate appraisers
38. Recreation workers
39. Restaurant, cafeteria, and bar managers
40. Sales managers and department heads (retail)
41. Sales managers (except retail)
42. Secondary/post-secondary vocational agriculture teachers
43. Statisticians
44. Stock and bond sales agents
45. Urban and regional planners

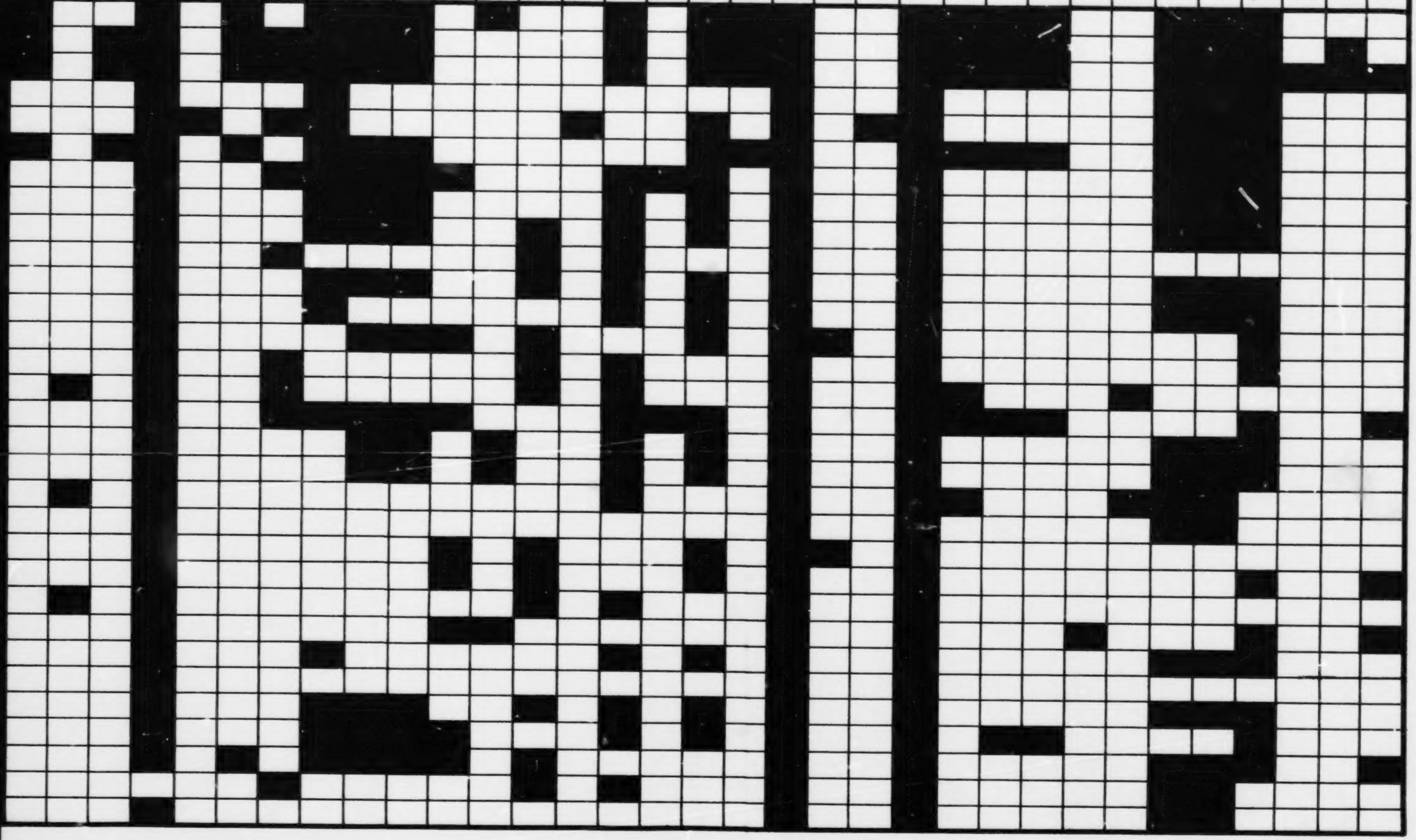

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Figure 3

Degree/Occupation Matrix for Doctoral Graduates in Food and Agricultural Specializations

OES-Census-Occupation Degree	1. Adult educators	2. Agricultural scientists	3. Assessors, controllers, treasurers (local public administration)	4. Bank officers and financial managers	5. Biological scientists	6. Buyers (wholesale and retail trade)	7. Buyers and shippers (farm products)	8. Chemists	9. Civil engineers	10. College and university faculty	11. Cooperative Extension Services personnel	12. Dietitians	13. Economists	14. Editors and reporters	15. Engineers, nec (agricultural engineers)	16. Farm management advisers (except Extension personnel)	17. Foresters and conservationists	18. Industrial engineers
1. Agricultural business		■	■	■		■	■			■	■			■				
2. Agricultural economics		■		■		■	■			■	■		■	■		■		
3. Agricultural education	■	■								■	■			■				
4. Agricultural engineering		■							■	■	■			■	■			■
5. Agriculture and farm management		■								■	■			■		■		
6. Agriculture and forest technologies		■								■	■			■			■	
7. Agronomy		■			■					■	■			■				
8. Animal science		■			■					■	■			■				
9. Biochemistry		■			■			■		■				■				
10. Dairy science		■			■					■	■			■				
11. Entomology		■			■			■		■	■			■				
12. Fish, game, wildlife management		■			■			■		■	■			■				
13. Food science technology		■			■					■	■			■			■	
14. Foods and nutrition		■			■			■		■	■	■		■				
15. Forestry		■			■					■	■			■			■	
16. Horticulture, fruit and vegetable		■			■					■	■			■				
17. Horticulture, ornamental		■			■					■	■			■				
18. Institution and cafeteria management										■		■		■				
19. Marine biology		■			■					■	■			■			■	
20. Natural resources management		■			■					■	■			■			■	
21. Nutrition, scientific		■			■			■		■		■		■				
22. Parks and recreation management										■				■				
23. Plant pathology		■			■					■	■			■				
24. Plant physiology		■			■			■		■				■				
25. Poultry science		■			■					■	■			■				
26. Range management		■			■					■	■			■			■	
27. Soil science		■						■		■	■			■			■	
28. Veterinary medicine (pre-professional)		■			■			■		■	■							
29. Veterinary medicine (D.V.M.)		■			■			■		■	■			■				
30. Veterinary medicine specialties (post-D.V.M.)		■			■			■		■	■			■				
31. Other (Agricultural communications/journalism)											■			■				

□ Degree program generally does not prepare student for occupation.

■ Degree program generally prepares student for occupation.

nec = not elsewhere classified.

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5. Biological scientists	6. Buyers (wholesale and retail trade)	7. Buyers and shippers (farm products)	8. Chemists	9. Civil engineers	10. College and university faculty	11. Cooperative Extension Services personnel	12. Dietitians	13. Economists	14. Editors and reporters	15. Engineers, nec (agricultural engineers)	16. Farm management advisers (except Extension personnel)	17. Foresters and conservationists	18. Industrial engineers	19. Managers and administrators, nec	20. Marine scientists	21. Mechanical engineers	22. Officials and administrators, nec (public administrators)	23. Restaurant, cafeteria, and bar managers	24. Statisticians	25. Urban and regional planners	26. Veterinarians
	■	■			■	■			■					■			■		■		
	■	■			■	■		■	■		■			■			■		■	■	
					■	■			■					■			■		■		
				■	■	■			■	■			■	■		■	■		■		
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Table 1.— Baccalaureate and higher degrees conferred in food and agricultural specializations[1]

Degree specialization[2]	Degree level			Total degrees
	Baccalaureate	Master's	Doctoral	
Agriculture, general	105	7	0	112
Agricultural business	1,576	44	1	1,621
Agricultural economics	1,811	569	149	2,529
Agricultural education[3]	1,751	848	33	2,632
Agricultural engineering	727	158	51	936
Agriculture and farm management	390	10	1	401
Agriculture and forest technologies	184	15	7	206
Agronomy	1,949	517	179	2,645
Animal science	4,489	535	133	5,157
Biochemistry	980	30	65	1,075
Dairy science	315	81	15	411
Entomology	216	220	80	516
Fish, game, wildlife management	1,601	370	69	2,040
Food science and technology	941	380	100	1,421
Foods and nutrition	4,621	1,072	46	5,739
Forestry	2,532	433	94	3,059
Horticulture, fruit and vegetable	2,123	313	72	2,508
Horticulture, ornamental	650	18	3	671
Institution and cafeteria management	681	78	0	759
Landscape architecture	286	23	0	309
Marine biology	119	16	5	140
Natural resources management	2,342	277	27	2,646
Nutrition, scientific	291	193	121	605
Parks and recreation management	2,991	302	0	3,293
Plant pathology	83	169	109	361
Plant physiology	17	15	18	50
Poultry science	124	46	13	183
Range management	305	62	22	389
Soil science	758	192	57	1,007
Veterinary medicine (D.V.M.)	N	N	1,714	1,714
Veterinary medicine specialties (post-D.V.M.)	0	136	57	193

N = not applicable

[1] Based on 1978/79 HEGIS data from the National Center for Education Statistics, Department of Education; includes nonresident aliens.

[2] Selected from "A Taxonomy of Instructional Programs in Higher Education," National Center for Education Statistics, Department of Education.

[3] Baccalaureate data based on annual surveys by the Professional Personnel Recruitment Committee, Agriculture Education Division, American Vocational Association; Master's data estimated by panel of consultants; Doctoral data from the National Research Council, National Academy of Sciences.

Table 2.—Baccalaureate and higher enrollment in food and agricultural specializations (sample = 70% population)[1]

Degree specialization[2]	Level of enrollment[3]			Total
	Baccalaureate	Master's	Doctoral	
Agriculture, general	6,282	274	2	6,568
Agricultural business	7,083	487	192	7,762
Agricultural economics	4,116	997	530	5,643
Agricultural education	3,654	1,171	193	5,018
Agricultural engineering	4,246	350	155	4,751
Agriculture and farm management	458	20	2	480
Agronomy	4,984	1,091	713	6,788
Animal science	14,728	1,378	612	16,718
Dairy science	967	161	93	1,221
Entomology	223	171	118	512
Fish, game, wildlife management	4,230	734	192	5,156
Food science and technology	3,994	1,613	593	6,200
Foods and nutrition	13,150	1,823	466	15,439
Forestry	21,156	2,189	713	24,057
Horticulture, fruit and vegetable	6,505	898	414	7,817
Horticulture, ornamental	3,149	229	39	3,417
Institution and cafeteria management	2,472	163	15	2,650
Landscape architecture	2,358	141	1	2,500
Marine biology	6	0	0	6
Natural resources management	889	329	49	1,267
Parks and recreation management	2,012	144	43	2,199
Plant pathology	506	581	461	1,548
Plant physiology	0	59	119	178
Poultry science	441	136	76	653
Range management	614	105	49	768
Soil science	1,851	499	372	2,722
Veterinary medicine (pre-professional)	4,282	37	35	4,354
Veterinary medicine (D.V.M.)[4]	N	N	5,711	5,711
Veterinary medicine specialties (post-D.V.M.)	N	1,134	700	1,834
Other (agricultural communications/ journalism)	856	41	0	897

N = not applicable

[1] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[2] See Appendix 2 for crosswalk used to summarize enrollment data from the Clemson University survey in accordance with the HEGIS taxonomy.

[3] Sample response rates to the Clemson University survey varied among Colleges of Agriculture and Natural Resources (.700), Schools of Forestry (.471), Schools of Veterinary Medicine (.500), and Colleges of Home Economics (.503). For purposes of comparison, all sample data from the Clemson University Survey presented in Table 2 for forestry, veterinary medicine, and home economics have been adjusted to represent a 70 percent response rate.

[4] Fall, 1980 data provided by the Association of American Veterinary Medical Colleges; population data adjusted to represent a 70 percent sample to facilitate comparison.

Table 3.—Occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Number of workers with baccalaureate or higher degrees in food and agricultural specializations					Percent of workers with baccalaureate or higher degrees in food and agricultural specializations[3]				
	Total	Female		Male		Percent of total workers in occupation[3]	Female[4]		Male[5]	
		Non-minority[6]	Minority[7]	Non-minority[6]	Minority[7]		Non-minority[6]	Minority[7]	Non-minority[6]	Minority[7]
Adult educators	1,680	571	119	930	60	3.0	34.0	7.1	55.3	3.6
Agricultural and biological technicians (except health)	24,192	9,145	532	13,426	1,089	56.0	37.8	2.2	55.5	4.5
Agricultural scientists	20,396	1,020	0	19,376	0	100.0	5.0	0.0	95.0	0.0
Architects (landscape)[8]	13,000	416	0	11,960	624	100.0	3.2	0.0	92.0	4.8
Assessors, controllors, treasurers (local public administration)	718	258	0	460	0	2.0	36.0	0.0	64.0	0.0
Bank officers and financial managers	9,532	2,211	142	6,884	295	1.9	23.2	1.5	72.2	3.1
Biological scientists	10,404	2,039	406	7,137	822	20.0	19.6	3.9	68.6	7.9
Buyers (wholesale and retail trade)	13,536	4,047	257	8,799	433	8.2	29.9	1.9	65.0	3.2
Buyers and shippers (farm products)	15,999	592	0	15,407	0	74.8	3.7	0.0	96.3	0.0
Chemical technicians	2,012	157	78	1,646	131	2.4	7.8	3.9	81.8	6.5
Chemists	12,526	1,228	200	10,384	714	10.0	9.8	1.6	82.9	5.7
Civil engineers	3,692	26	22	3,426	218	2.3	0.7	0.6	92.8	5.9
College and university faculty[9]	25,897	NA	NA	NA	NA	NA	NA	NA	NA	NA
Cooperative Extension Services personnel[10]	17,771	5,364	784	10,882	741	100.0	30.2	4.4	61.2	4.2
Credit and collection managers	954	342	36	558	18	1.8	35.8	3.8	58.5	1.9
Dietitians	45,790	32,557	9,158	4,075	0	100.0	71.1	20.0	8.9	0.0
Economists	4,690	586	89	3,696	319	4.4	12.5	1.9	78.8	6.8
Editors and reporters	3,174	1,371	86	1,612	105	1.9	43.2	2.7	50.8	3.3
Engineers, nec[11] (agricultural engineers)	12,000	84	72	11,088	756	7.4	0.7	0.6	92.4	6.3
Estimators and investigators, nec	14,840	6,248	965	7,301	326	3.6	42.1	6.5	49.2	2.2
Expediters and product controllers	10,288	2,736	350	6,605	597	5.0	26.6	3.4	64.2	5.8
Farm management advisers (except Extension personnel)	1,250	313	0	833	104	100.0	25.0	0.0	66.7	8.3
Farm managers	20,000	800	0	19,200	0	80.0	4.0	0.0	96.0	0.0
Farmers (owners and tenants)	223,193	13,168	223	203,106	6,696	15.0	5.9	0.1	91.0	3.0
Food service workers, nec (except private)	19,206	11,562	3,207	3,573	864	4.5	60.2	16.7	18.6	4.5
Foresters and conservationists	49,187	2,656	0	45,203	1,328	100.0	5.4	0.0	91.9	2.7
Gardeners and groundskeepers (except farm)	14,976	509	45	11,816	2,606	2.4	3.4	0.3	78.9	17.4

See footnotes at end of table.

Table 3.—Occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations[1]—Continued

OES-census-occupation[2]	Number of workers with baccalaureate or higher degrees in food and agricultural specializations					Percent of workers with baccalaureate or higher degree in food and agricultural specializations				
	Total	Female		Male		Percent of total workers in occupation[3]	Female[4]		Male[5]	
		Non-minority[6]	Minority[7]	Non-Minority[6]	Minority[7]		Non-minority[6]	Minority[7]	Non-minority[6]	Minority[7]
Health aides (except nursing)	6,664	4,418	1,166	847	233	2.9	66.3	17.5	12.7	3.5
Health technicians/technologists, nec	7,959	4,266	780	2,770	143	7.0	53.6	9.8	34.8	1.8
Industrial engineers	9,250	370	46	8,695	139	5.0	4.0	0.5	94.0	1.5
Inspectors (public administration--except construction)	22,793	1,801	205	18,986	1,801	20.0	7.9	0.9	83.3	7.9
Inspectors, scalers, and graders (log and lumber)	18,394	2,906	0	14,513	975	100.0	15.8	0.0	78.9	5.3
Insurance adjusters, examiners, and investigators	17,673	7,705	1,361	8,148	459	11.3	43.6	7.7	46.1	2.6
Insurance agents, brokers, and underwriters	9,547	1,470	95	7,648	334	2.0	15.4	1.0	80.1	3.5
Managers and administrators, nec	168,753	23,119	1,350	139,559	4,725	74.8	13.7	0.8	82.7	2.8
Marine scientists	600	0	0	600	0	8.4	0.0	0.0	100.0	0.0
Mechanical engineers	12,218	61	0	11,302	855	6.0	0.5	0.0	92.5	7.0
Officials and administrators, nec (public administrators)	14,743	3,140	398	10,232	973	5.0	21.3	2.7	69.4	6.6
Purchasing agents and buyers, nec	7,651	1,438	77	5,891	245	4.0	18.8	1.0	77.0	3.2
Real estate agents and brokers	9,018	3,634	81	5,141	162	2.0	40.3	0.9	57.0	1.8
Real estate appraisers	1,520	96	47	1,377	0	5.0	6.3	3.1	90.6	0.0
Recreation workers	9,449	4,602	794	3,420	633	7.7	48.7	8.4	36.2	6.7
Restaurant, cafeteria, and bar managers	5,516	1,754	177	3,326	259	1.0	31.8	3.2	60.3	4.7
Sales managers and department heads (retail)	21,878	7,548	197	13,455	678	6.7	34.5	0.9	61.5	3.1
Sales managers (except retail)	27,269	1,063	191	25,579	436	9.2	3.9	0.7	93.8	1.6
Sales workers and sales clerks, nec	49,756	21,495	1,095	26,071	1,095	1.2	43.2	2.2	52.4	2.2
Secondary/post-secondary vocational agriculture teachers[12]	12,800	NA	NA	NA	NA	100.0	NA	NA	NA	NA
Statisticians	831	238	29	504	60	3.4	28.6	3.5	60.7	7.2
Stock and bond sales agents	17,213	2,083	0	14,941	189	18.9	12.1	0.0	86.8	1.1
Surveyors	1,929	27	0	1,902	0	3.6	1.4	0.0	98.6	0.0
Urban and regional planners	2,292	144	0	2,004	144	14.1	6.3	0.0	87.4	6.3
Veterinarians	24,693	2,642	0	22,051	0	100.0	10.7	0.0	89.3	0.0

NA = not available

[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Percent of total number of workers in each selected OES-census-based occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations.

(Footnotes Continued)

Table 3.—Occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations[1] – Continued

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(Footnotes Continued)

[4] Percent of workers in each occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations who are female.

[5] Percent of workers in each occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations who are male.

[6] Includes Whites and White-Hispanics.

[7] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[8] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[9] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. No sex by minority status data were collected. See Appendix 5 for detailed data.

[10] Based on Science and Education, Cooperative Extension Service's master personnel file, May 1981; does not include 829 employees for whom race/ethic status is unknown. Nonminority status refers only to Non-Spanish Caucasians. See Appendixes 6 and 7 for detailed data.

[11] nec = not elsewhere classified.

[12] 1979 data provided by the Office of Vocational and Adult Education, DOED; no sex by minority status available.

CHAPTER III

SEX OF GRADUATES OF HIGHER EDUCATION IN THE FOOD AND AGRICULTURAL SCIENCES AND OF WORKERS IN FOOD AND AGRICULTURAL OCCUPATIONS

The purpose of this chapter is twofold. One major purpose is to present data pertaining to graduates of higher education in the food and agricltural sciences, classified by sex and by field of study. A second purpose is to present data on occupational employment of food and agricultural professionals, classified by sex. The chapter contains tables which identify and rank: numbers of degrees conferred to females and to males at the baccalaureate, master's and doctoral levels in the specializations comprising the food and agricultural sciences; numbers and percent of females and of males in food and agricultural occupations; trends related to employment of males and of females in food and agricultural occupations; and estimated average annual openings through 1985 for all workers, regardless of sex, in food and agricultural occupations.

Many of the statistics presented in this chapter are derived from the National Center for Education Statistics and the Bureau of Labor Statistics. When necessary, these statistics have been supplemented with data from the American Vocational Association, the National Academy of Sciences, Clemson University, USDA Cooperative Extension Services, and DOED Office of Adult and Vocational Education. Substantial contributions were made by the panel of consultants with regard to identifying basic assumptions essential to extraction and analysis of these data.

As shown in tables 4-7, findings derived from the study germane to sex of graduates in the food and agricultural sciences include the following:

1. At the baccalaureate level--

   - female graduates outnumber male graduates in foods and nutrition, scientific nutrition, institution and cafeteria management, parks and recreation management, plant physiology, and food science and technology,

   - male graduates outnumber female graduates to the greatest extent in agricultural engineering, agriculture and farm management, agricultural economics, forestry, agricultural business, and range management,

   - male-female ratios are relatively comparable for graduates in fruit and vegetable horticulture and in ornamental horticulture,

   - specializations with the largest number of female graduates include foods and nutrition, animal science, parks and recreation management, fruit and vegetable horticulture, and natural resources management,

   - specializations with the largest number of male graduates include animal science, forestry, natural resources management, agronomy, and agricultural economics.

2. At the master's level--

   - female graduates outnumber male graduates in foods and nutrition, institution and cafeteria management, scientific nutrition, plant physiology, and parks and recreation management,

   - male graduates outnumber female graduates most significantly in ornamental horticulture, agricultural engineering, agriclutural business, agricultural economics, and general agriculture,

   - male and female graduates are relatively comparable in biochemistry and in food science and technology,

   - specializations with the largest number of female graduates include foods and nutrition, parks and recreation management, food science and technology, scientific nutrition, and animal science,

   - specializations with the largest number of male graduates include agricultural economics, agronomy, animal science, forestry, and fish/game/wildlife management.

3. At the doctoral level--

   - female graduates exceed males only in foods and nutrition,

   - male graduates exceed females for all other degree specializations,

   - specializations with the largest number of female graduates include veterinary medicine (D.V.M.), scientific nutrition, foods and nutrition, plant pathology, and food science and technology,

   - specializations with the largest number of male graduates include veterinary medicine (D.V.M.), agronomy, agricultural economics, animal science, and plant pathology.

For employment in food and agricultural occupations as shown in tables 8-12, findings concerning sex of workers include:

1. Occupations in which female workers outnumber male workers are dietitian, health aide, food service worker, health technician, recreation worker, and insurance adjuster/examiner/investigator.

2. Occupations for which male-female ratios are relatively comparable include estimator or investigator, editor or reporter, sales worker or sales clerk, real estate agent or broker, and agricultural or biological technician.

3. The greatest number of females are employed as dietitians, managers or administrators, sales workers or sales clerks, food service workers, farmers, and agriclutural or biological technicians.

4. The greatest number of males are employed as farmers, managers or administrators, foresters or conservationists, sales workers or sales clerks, sales managers, and veterinarians.

5. Historical data for 1972 through 1978 reveal that the percent of female employment has increased virtually across the full spectrum of food and agricultural occupations, most notably in such occupations as farm management advisor, marine scientist, insurance adjuster/inspector/investigator, assessor/controller/treasurer, and biological scientist.

6. Females experienced the greatest percent relative change from 1972 through 1978 in employment as industrial engineers, farm managers, civil engineers, real estate appraisers, and gardeners or groundskeepers (for example, landscape gardener).

7. Through 1985, estimated average annual openings in food and agricultural occupations are largest for managers or administrators, farmers, dietitians, farm managers, foresters or conservationists, sales workers or sales clerks, biological scientists, secondary and post secondary vocational agriculuture teachers, and inspectors.

Table 4.—Graduates with baccalaureate or higher degrees in food and agricultural specializations by sex and by field of study[1]

Degree specialization[2]	Degree level											
	Baccalaureate				Master's				Doctoral			
	Female		Male		Female		Male		Female		Male	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Agriculture, general	23	21.9	82	78.1	1	14.3	6	85.7	0	0.0	0	0.0
Agricultural business	215	13.6	1,361	86.4	4	9.1	40	90.9	0	0.0	1	100.0
Agricultural economics	229	12.6	1,582	87.4	63	11.1	506	88.9	12	8.1	137	91.9
Agricultural education	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Agricultural engineering	45	6.2	682	93.8	8	5.1	150	94.9	1	2.0	50	98.0
Agriculture and farm management	37	9.5	353	90.5	2	20.0	8	80.0	0	0.0	1	100.0
Agriculture and forest technologies	24	13.0	160	87.0	3	20.0	12	80.0	1	14.3	6	85.7
Agronomy	331	17.0	1,618	83.0	81	15.7	436	84.3	8	4.5	171	95.5
Animal science	1,763	39.3	2,726	60.7	116	21.7	419	78.3	6	4.5	127	95.5
Biochemistry	324	33.1	656	66.9	13	43.3	17	56.7	16	24.6	49	75.4
Dairy science	85	27.0	230	73.0	19	23.5	62	76.5	3	20.0	12	80.0
Entomology	52	24.1	164	75.9	53	24.1	167	75.9	5	6.3	75	93.8
Fish, game, wildlife management	320	20.0	1,281	80.0	63	17.0	307	83.0	2	2.9	67	97.1
Food science and technology	493	52.4	448	47.6	157	41.3	223	58.7	20	20.0	80	80.0
Foods and nutrition	4,380	94.8	241	5.2	1,019	95.1	53	4.9	36	78.3	10	21.7
Forestry	344	13.6	2,188	86.4	65	15.0	368	85.0	8	8.5	86	91.5
Horticulture, fruit and vegetable	977	46.0	1,146	54.0	101	32.3	212	67.7	9	12.5	63	87.5
Horticulture, ornamental	270	41.5	380	58.5	9	0.0	9	100.0	0	0.0	3	100.0
Institution and cafeteria management	440	64.6	241	35.4	70	89.7	8	10.3	0	0.0	0	0.0
Landscape architecture	77	26.9	209	73.1	9	39.1	14	60.9	0	0.0	0	0.0
Marine biology	36	30.3	83	69.7	4	25.0	12	75.0	0	0.0	5	100.0
Natural resources management	683	29.2	1,659	70.8	48	17.3	229	82.7	3	11.1	24	88.9
Nutrition, scientific	252	86.6	39	13.4	126	65.3	67	34.7	59	48.8	62	51.2
Parks and recreation management	1,703	56.9	1,288	43.1	158	52.3	144	47.7	0	0.0	0	0.0
Plant pathology	30	36.1	53	63.9	53	31.4	116	68.6	22	20.2	87	79.8
Plant physiology	9	52.9	8	47.1	8	53.3	7	46.7	3	16.7	15	83.3
Poultry science	29	23.4	95	76.6	10	21.7	36	78.3	0	0.0	13	100.0
Range management	43	14.1	262	85.5	11	17.7	51	82.3	0	0.0	22	100.0
Soil science	213	28.1	545	71.9	31	16.1	161	83.9	1	1.8	56	98.2
Veterinary medicine (D.V.M.)	N	N	N	N	N	N	N	N	496	28.9	1,218	71.1
Veterinary medicine specialties (post-D.V.M.)	0	0.0	0	0.0	29	21.3	107	78.7	5	8.8	52	91.2

N = not applicable

NA = not available

[1] Based on 1978/79 HEGIS data from the National Center for Education Statistics, Department of Education; includes nonresident aliens.

[2] Selected from "A Taxonomy of Instructional Programs in Higher Education," National Center for Education Statistics, Department of Education.

Table 5.—Baccalaureate graduates in food and agricultural specializations ranked by field of study and by sex[1]

Degree specialization[2]	Degrees conferred					
	Total		Female		Male	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Foods and nutrition	4,621	1.0	4,380	1.0	241	17.5
Animal science	4,489	2.0	1,763	2.0	2,726	1.0
Parks and recreation management	2,991	3.0	1,703	3.0	1,288	7.0
Forestry	2,532	4.0	344	8.0	2,188	2.0
Natural resources management	2,342	5.0	683	5.0	1,659	3.0
Horticulture, fruit and vegetable	2,123	6.0	977	4.0	1,146	9.0
Agronomy	1,949	7.0	331	9.0	1,618	4.0
Agricultural economics	1,811	8.0	229	14.0	1,582	5.0
Agricultural education[3]	1,751	9.0	NA	NA	NA	NA
Fish, game, wildlife management	1,601	10.0	320	11.0	1,281	8.0
Agricultural business	1,576	11.0	215	15.0	1,361	6.0
Biochemistry	980	12.0	324	10.0	656	11.0
Food science and technology	941	13.0	493	6.0	448	13.0
Soil science	758	14.0	213	16.0	545	12.0
Agricultural engineering	727	15.0	45	20.0	682	10.0
Institution and cafeteria management	681	16.0	448	7.0	241	17.5
Horticulture, ornamental	650	17.0	270	12.0	380	14.0
Agriculture and farm management	390	18.0	37	22.0	353	15.0
Dairy science	315	19.0	85	17.0	230	19.0
Range management	305	20.0	43	21.0	262	16.0
Nutrition, scientific	291	21.0	252	13.0	39	27.0
Landscape architecture	286	22.0	77	18.0	209	20.0
Entomology	216	23.0	52	19.0	164	21.0
Agriculture and forestry technologies	184	24.0	24	26.0	160	22.0
Poultry science	124	25.0	29	25.0	95	23.0
Marine biology	119	26.0	36	23.0	83	24.0
Agriculture, general	105	27.0	23	27.0	82	25.0
Plant pathology	83	28.0	30	24.0	53	26.0
Plant physiology	17	29.0	9	28.0	8	28.0

NA = not available

[1] Based on 1978/79 HEGIS data from the National Center for Education Statistics, Department of Education; includes nonresident aliens.

[2] Selected from "A Taxonomy of Instructional Programs in Higher Education," National Center for Education Statistics, Department of Education.

[3] Source: Professional Personnel Recruitment Committee, Agriculture Education Division, American Vocational Association.

Table 6.—Master's graduates in food and agricultural specializations ranked by field of study and by sex[1]

Degree specialization[2]	Degrees conferred					
	Total		Female		Male	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Foods and nutrition	1,072	1.0	1,019	1.0	53	17.0
Agricultural education	848	2.0	NA	NA	NA	NA
Agricultural economics	569	3.0	63	10.5	506	1.0
Animal science	535	4.0	116	5.0	419	3.0
Agronomy	517	5.0	81	7.0	436	2.0
Forestry	433	6.0	65	9.0	368	4.0
Food science and technology	380	7.0	157	3.0	223	7.0
Fish, game, wildlife management	370	8.0	63	10.5	307	5.0
Horticulture, fruit and vegetable	313	9.0	101	6.0	212	8.0
Parks and recreation management	302	10.0	158	2.0	144	12.0
Natural resources management	277	11.0	48	14.0	229	6.0
Entomology	220	12.0	53	12.5	167	9.0
Nutrition, scientific	193	13.0	126	4.0	67	15.0
Soil science	192	14.0	31	15.0	161	10.0
Plant pathology	169	15.0	53	12.5	116	13.0
Agricultural engineering	158	16.0	8	23.5	150	11.0
Veterinary medicine specialties (post-D.V.M.)	136	17.0	29	16.0	107	14.0
Dairy science	81	18.0	19	17.0	62	16.0
Institution and cafeteria management	78	19.0	70	8.0	8	26.5
Range management	62	20.0	11	19.0	51	18.0
Poultry science	46	21.0	10	20.0	36	20.0
Agricultural business	44	22.0	4	25.5	40	19.0
Biochemistry	30	23.0	13	18.0	17	21.0
Landscape architecture	23	24.0	9	21.5	14	22.0
Horticulture, ornamental	18	25.0	9	21.5	9	25.0
Marine biology	16	26.0	4	25.5	12	23.5
Agriculture and forestry technologies	15	27.5	3	27.0	12	23.5
Plant physiology	15	27.5	8	23.5	7	28.0
Agriculture and farm management	10	29.0	2	28.0	8	26.5
Agriculture, general	7	30.0	1	29.0	6	29.0

NA = not available

[1] Based on 1978/79 HEGIS data from the National Center for Education Statistics, Department of Education; includes nonresident aliens.

[2] Selected from "A Taxonomy of Instructional Programs in Higher Education," National Center for Education Statistics, Department of Education.

[3] Data estimated by the panel of consultants.

Table 7.—Doctoral graduates in food and agricultural specializations ranked by field of study and by sex[1]

Degree specialization[2]	Degrees conferred					
	Total		Female		Male	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Veterinary medicine (D.V.M.)	1,714	1.0	496	1.0	1,218	1.0
Agronomy	179	2.0	8	9.5	171	2.0
Agricultural economics	149	3.0	12	7.0	137	3.0
Animal science	133	4.0	6	11.0	127	4.0
Nutrition, scientific	121	5.0	59	2.0	62	11.0
Plant pathology	109	6.0	22	4.0	87	5.0
Food science and technology	100	7.0	20	5.0	80	7.0
Forestry	94	8.0	8	9.5	86	6.0
Entomology	80	9.0	5	12.5	75	8.0
Horticulture, fruit and vegetable	72	10.0	9	8.0	63	10.0
Fish, game, wildlife management	69	11.0	2	18.0	67	9.0
Biochemistry	65	12.0	16	6.0	49	15.0
Soil science	57	13.5	1	20.0	56	12.0
Veterinary medicine specialties (post-D.V.M.)	57	13.5	5	12.5	52	13.0
Agricultural engineering	51	15.0	1	20.0	50	14.0
Foods and nutrition	46	16.0	36	3.0	10	21.0
Agricultural education[3]	33	17.0	NA	NA	NA	NA
Natural resources management	27	18.0	3	15.0	24	16.0
Range management	22	19.0	0	25.5	22	17.0
Plant physiology	18	20.0	3	15.0	15	18.0
Dairy science	15	21.0	3	15.0	12	20.0
Poultry science	13	22.0	0	25.5	13	19.0
Agriculture and forestry technologies	7	23.0	1	20.0	6	22.0
Marine biology	5	24.0	0	25.5	5	23.0
Horticulture, ornamental	3	25.0	0	25.5	3	24.0
Agriculture and farm management	1	26.5	0	25.5	1	25.5
Agricultural business	1	26.5	0	25.5	1	25.5
Institution and cafeteria management	0	28.5	0	25.5	0	28.5
Parks and recreation management	0	28.5	0	25.5	0	28.5

NA = not available

[1] Based on 1978/79 HEGIS data from the National Center for Education Statistics, Department of Education; includes nonresident aliens.

[2] Selected from "A Taxonomy of Instructional Programs in Higher Education," National Center for Education Statistics, Department of Education.

[3] Source: National Research Council, National Academy of Sciences.

Table 8.—Occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations by sex[1]

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations			
	Female		Male	
	Frequency	Percent	Frequency	Percent
Adult educators	690	41.1	990	58.9
Agricultural and biological technicians (except health)	9,677	40.0	14,515	60.0
Agricultural scientists	1,020	5.0	19,376	95.0
Architects (landscape)[3]	416	3.2	12,584	96.8
Assessors, controllers, treasurers (local public administration)	258	35.9	460	64.1
Bank officers and financial managers	2,353	24.7	7,179	75.3
Biological scientists	2,445	23.5	7,959	76.5
Buyers (wholesale and retail trade)	4,304	31.8	9,232	68.2
Buyers and shippers (farm products)	592	3.7	15,407	96.3
Chemical technicians	235	11.7	1,777	88.3
Chemists	1,428	11.4	11,098	88.6
Civil engineers	48	1.3	3,644	98.7
College and university faculty[4]	4,350	16.8	21,547	83.2
Cooperative Extension Services personnel[5]	6,463	34.7	12,137	65.3
Credit and collection managers	378	39.6	576	60.4
Dietitians	41,715	91.1	4,075	8.9
Economists	675	14.4	4,015	85.6
Editors and reporters	1,457	46.0	1,717	54.0
Engineers, nec[6] (agricultural engineers)	156	1.3	11,844	98.7
Estimators and investigators, nec	7,213	48.6	7,627	51.4
Expediters and product controllers	3,086	30.0	7,202	70.0
Farm management advisers (except Extension personnel)	313	25.0	937	75.0
Farm managers	800	4.0	19,200	96.0
Farmers (owners and tenants)	13,391	6.0	209,802	94.0
Food service workers, nec (except private)	14,769	76.9	4,437	23.1
Foresters and conservationists	2,656	5.4	46,531	94.6
Gardeners and groundskeepers (except farm)	554	3.7	14,422	96.3
Health aides (except nursing)	5,584	83.8	1,080	16.2
Health technicians/technologists, nec	5,046	63.4	2,913	36.6
Industrial engineers	416	4.5	8,834	95.5
Inspectors (public administration--except construction)	2,006	8.8	20,787	91.2
Inspectors, scalers, and graders (log and lumber)	2,906	15.8	15,488	84.2

See footnotes at end of table.

Table 8.—Occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations by sex[1]—Continued

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations			
	Female		Male	
	Frequency	Percent	Frequency	Percent
Insurance adjusters, examiners, and investigators	9,066	51.3	8,607	48.7
Insurance agents, brokers, and underwriters	1,565	16.4	7,982	83.6
Managers and administrators, nec	24,469	14.5	144,284	85.5
Marine scientists	0	0.0	600	100.0
Mechanical engineers	61	0.5	12,157	99.5
Officials and administrators, nec (public administrators)	3,538	24.0	11,205	76.0
Purchasing agents and buyers, nec	1,515	19.8	6,136	80.2
Real estate agents and brokers	3,715	41.2	5,303	58.8
Real estate appraisers	143	9.4	1,377	90.6
Recreation workers	5,396	57.1	4,053	42.9
Restaurant, cafeteria, and bar managers	1,931	35.0	3,585	65.0
Sales managers and department heads (retail)	7,745	35.4	14,133	64.6
Sales managers (except retail)	1,254	4.6	26,015	95.4
Sales workers and sales clerks, nec	22,590	45.4	27,166	54.6
Secondary/post-secondary vocational agriculture teachers[7]	678	5.3	12,122	94.7
Statisticians	267	32.1	564	67.9
Stock and bond sales agents	2,083	12.1	15,130	87.9
Surveyors	27	1.4	1,902	98.6
Urban and regional planners	144	6.3	2,148	93.7
Veterinarians	2,642	10.7	22,051	89.3

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[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[4] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. See Appendix 5 for detailed data.

[5] Based on Science and Education, Cooperative Extension Services master personnel file, May, 1981. See Appendix 6 for detailed data.

[6] nec = not elsewhere classified.

[7] 1979 data provided by the Office of Vocational and Adult Education, DOED.

Table 9.— Workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by sex[1]

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations									
	Total employment		Female				Male			
	Number employed	Rank by number employed	Number employed	Rank by number employed	Percent employment	Rank by percent employment	Number employed	Rank by number employed	Percent employment	Rank by percent employment
Farmers (owners and tenants)	223,193	1.0	13,391	5.0	6.0	38.0	209,802	1.0	94.0	15.0
Managers and administrators, nec[3]	168,753	2.0	24,469	2.0	14.5	29.0	144,284	2.0	85.5	24.0
Sales workers and sales clerks, nec	49,756	3.0	22,590	3.0	45.4	9.0	27,166	4.0	54.6	44.0
Foresters and conservationists	49,187	4.0	2,656	20.0	5.4	39.0	46,531	3.0	94.6	14.0
Dietitians	45,790	5.0	41,715	1.0	91.1	1.0	4,075	35.0	8.9	52.0
Sales managers (except retail)	27,269	6.0	1,254	31.0	4.6	42.0	26,015	5.0	95.4	11.0
College and university faculty[4]	25,897	7.0	4,350	14.0	16.8	26.0	21,547	7.0	83.2	27.0
Veterinarians	24,693	8.0	2,642	21.0	10.7	34.0	22,051	6.0	89.3	19.0
Agricultural and biological technicians (except health)	24,192	9.0	9,677	6.0	40.0	12.0	14,515	14.0	60.0	41.0
Inspectors (public administration--except construction)	22,793	10.0	2,006	25.0	8.8	36.0	20,787	8.0	91.2	17.0
Sales managers and department heads (retail)	21,878	11.0	7,745	8.0	35.4	15.0	14,133	16.0	64.6	38.0
Agricultural scientists	20,396	12.0	1,020	32.0	5.0	41.0	19,376	9.0	95.0	12.0
Farm managers	20,000	13.0	800	33.0	4.0	44.0	19,200	10.0	96.0	9.0
Food service workers, nec (except private)	19,206	14.0	14,769	4.0	76.9	3.0	4,437	34.0	23.1	50.0
Cooperative Extension Services personnel[5]	18,600	15.0	6,463	10.0	34.7	17.0	12,137	19.0	65.3	36.0
Inspectors, scalers, and graders (log and lumber)	18,394	16.0	2,906	19.0	15.8	28.0	15,488	11.0	84.2	25.0
Insurance adjusters, examiners, and investigators	17,673	17.0	9,066	7.0	51.3	6.0	8,607	26.0	48.7	47.0
Stock and bond sales agents	17,213	18.0	2,083	24.0	12.1	31.0	15,130	13.0	87.9	22.0
Buyers and shippers (farm products)	15,999	19.0	59	37.0	3.7	45.0	15,407	12.0	96.3	8.0
Gardeners and groundskeepers (except farm)	14,976	20.0	544	38.0	3.7	46.0	14,422	15.0	96.3	7.0
Estimators and investigators, nec	14,840	21.0	7,213	9.0	48.6	7.0	7,627	29.0	51.4	46.0
Officials and administrators, nec (public administrators)	14,743	22.0	3,538	17.0	24.0	23.0	11,205	22.0	76.0	30.0
Buyers (wholesale and retail trade)	13,536	23.0	4,304	15.0	31.8	19.0	9,232	24.0	68.2	34.0
Architects (landscape)[6]	13,000	24.0	416	39.5	3.2	47.0	12,584	17.0	96.8	6.0
Secondary/post-secondary vocational agriculture teachers[7]	12,800	25.0	678	35.0	5.3	40.0	12,122	20.0	94.7	13.0
Chemists	12,526	26.0	1,428	30.0	11.4	33.0	11,098	23.0	88.6	20.0
Mechanical engineers	12,218	27.0	61	49.0	0.5	51.0	12,157	18.0	99.5	2.0
Engineers, nec (agricultural engineers)	12,000	28.0	156	46.0	1.3	50.0	11,844	21.0	98.7	3.0

See footnotes at end of table.

Table 9.—Workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by sex[1]—Continued

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations									
	Total employment		Female				Male			
	Number employed	Rank by number employed	Number employed	Rank by number employed	Percent employment	Rank by percent employment	Number employed	Rank by number employed	Percent employment	Rank by percent employment
Biological scientists	10,404	29.0	2,445	22.0	23.5	24.0	7,959	28.0	76.5	29.0
Expediters and product controllers	10,288	30.0	3,086	18.0	30.0	20.0	7,202	30.0	70.0	33.0
Insurance agents, brokers, and underwriters	9,547	31.0	1,565	27.0	16.4	27.0	7,982	27.0	83.6	26.0
Bank officers and financial managers	9,532	32.0	2,353	23.0	24.7	22.0	7,179	31.0	75.3	31.0
Recreation workers	9,449	33.0	5,396	12.0	57.1	5.0	4,053	36.0	42.9	48.0
Industrial engineers	9,250	34.0	416	39.5	4.5	43.0	8,834	25.0	95.5	10.0
Real estate agents and brokers	9,018	35.0	3,715	16.0	41.2	10.0	5,303	33.0	58.8	43.0
Health technicians/technologists, nec	7,959	36.0	5,046	13.0	63.4	4.0	2,913	40.0	36.6	49.0
Purchasing agents and buyers, nec	7,651	37.0	1,515	28.0	19.8	25.0	6,136	32.0	80.2	28.0
Health aides (except nursing)	6,664	38.0	5,584	11.0	83.8	2.0	1,080	46.0	16.2	51.0
Restaurant, cafeteria, and bar managers	5,516	39.0	1,931	26.0	35.0	16.0	3,585	39.0	65.0	37.0
Economists	4,690	40.0	675	36.0	14.4	30.0	4,015	37.0	85.6	23.0
Civil engineers	3,692	41.0	48	50.0	1.3	49.0	3,644	38.0	98.7	4.0
Editors and reporters	3,174	42.0	1,457	29.0	46.0	8.0	1,717	44.0	54.0	45.0
Urban and regional planners	2,292	43.0	144	47.0	6.3	37.0	2,148	41.0	93.7	16.0
Chemical technicians	2,012	44.0	235	45.0	11.7	[illegible]	1,777	43.0	88.3	21.0
Surveyors	1,929	45.0	27	51.0	1.4	48.0	1,902	42.0	98.6	5.0
Adult educators	1,680	46.0	690	34.0	41.1	11.0	990	47.0	58.9	42.0
Real estate appraisers	1,520	47.0	143	48.0	9.4	35.0	1,377	45.0	90.6	18.0
Farm management advisers (except Extension personnel)	1,250	48.0	313	42.0	25.0	21.0	937	48.0	75.0	32.0
Credit and collection managers	954	49.0	378	41.0	39.6	13.0	576	50.0	60.4	40.0
Statisticians	831	50.0	267	43.0	32.1	18.0	564	51.0	67.9	35.0
Assessors, controllers, treasurers (local public administration)	718	51.0	258	44.0	35.9	14.0	460	52.0	64.1	39.0
Marine scientists	600	52.0	0	52.0	0.0	52.0	600	49.0	100.0	1.0

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[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] nec = not elsewhere classified.

[4] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. See Appendix 5 for detailed data.

[5] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981. See Appendix 6 for detailed data.

[6] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[7] 1979 data provided by the Office of Vocational and Adult Education, DOED.

Table 10.—Occupational employment of female and male workers and estimated demand for graduates with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations		1976-85 estimated average annual openings (both sexes)[3]
	Female	Male	
Adult educators	690	990	118
Agricultural and biological technicians (except health)	9,677	14,515	850
Agricultural scientists	1,020	19,376	1,304
Architects (landscape)[4]	416	12,584	964
Assessors, controllers, treasurers (local public administration)	258	460	46
Bank officers and financial managers	2,353	7,179	746
Biological scientists	2,445	7,959	663
Buyers (wholesale and retail trade)	4,304	9,232	1,702
Buyers and shippers (farm products)	592	15,407	812
Chemical technicians	235	1,777	17
Chemists	1,428	11,098	1,058
Civil engineers	48	3,644	186
College and university faculty[5]	4,350	21,547	1,082
Cooperative Extension Services personnel[6]	6,463	12,137	1,255
Credit and collection managers	378	576	32
Dietitians	41,715	4,075	2,763
Economists	675	4,015	246
Editors and reporters	1,457	1,717	226
Engineers, nec[7] (agricultural engineers)	156	11,844	633
Estimators and investigators, nec	7,213	7,627	1,111
Expediters and product controllers	3,086	7,202	613
Farm management advisers (except Extension personnel)	313	937	8
Farm managers	800	19,200	2,391
Farmers (owners and tenants)	13,391	209,802	3,728
Food service workers, nec (except private)	11,769	4,437	821
Foresters and conservationists	2,656	46,531	2,082
Gardeners and groundskeepers (except farm)	554	14,422	1,067
Health aides (except nursing)	5,584	1,080	738
Health technicians/technologists, nec	5,046	2,913	365
Industrial engineers	416	8,834	518
Inspectors (public administration--except construction)	2,006	20,787	1,533
Inspectors, scalers, and graders (log and lumber)	2,906	15,488	763
Insurance adjusters, examiners, and investigators	9,066	8,607	893
Insurance agents, brokers, and underwriters	1,565	7,982	515

See footnotes at end of table.

Table 10.—Occupational employment of female and male workers and estimated demand for graduates with baccalaureate or higher degrees in food and agricultural specializations[1]—Continued

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations		1976-85 estimated average annual openings (both sexes)
	Female	Male	
Managers and administrators, nec	24,469	144,284	5,960
Marine scientists	0	600	26
Mechanical engineers	61	12,157	522
Officials and administrators, nec (public administrators)	3,538	11,205	988
Purchasing agents and buyers, nec	1,515	6,136	304
Real estate agents and brokers	3,715	5,303	872
Real estate appraisers	143	1,377	102
Recreation workers	5,396	4,053	538
Restaurant, cafeteria, and bar managers	1,931	3,585	286
Sales managers and department heads (retail)	7,745	14,133	1,300
Sales managers (except retail)	1,254	26,015	671
Sales workers and sales clerks, nec	22,590	27,166	1,813
Secondary/post-secondary vocational agriculture teachers[8]	678	12,122	1,600
Statisticians	267	564	32
Stock and bond sales agents	2,083	15,130	945
Surveyors	27	1,902	85
Urban and regional planners	144	2,148	200
Veterinarians	2,642	22,051	1,448

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[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Projected annual job openings through 1985 for graduates in food and agricultural specializations generated using the Occupational Employment Statistics Program, DOL; includes openings due to employee deaths, retirements, disabilities, and temporary withdrawals, as well as industry growth.

[4] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[5] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. See Appendix 5 for detailed data.

[6] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981. See Appendix 6 for detailed data.

[7] nec = not elsewhere classified.

[8] 1979 female and male employment data provided by the Office of Vocational and Adult Education, DOED; average annual openings based on data provided by the Professional Personnel Recruitment Committee, Agriculture Education Division, American Vocational Association.

Table 11.—Trends related to occupational employment of females with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Females with baccalaureate or higher degrees in food and agricultural specializations				
	Number employed 1976	Percent of occupational employment[3]		Change in percent from 1972-1978	Percent relative change from 1972-1978[4]
		1972	1978		
Adult educators	690	37.7	49.4	11.7	31.0
Agricultural and biological technicians (except health)	9,677	29.3	31.9	2.6	8.9
Agricultural scientists	1,020	0.0	10.5	10.5	NC
Architects[5]	416	3.0	5.8	2.8	93.3
Assessors, controllers, treasurers (local public administration)	258	34.5	50.0	15.5	44.9
Bank officers and financial managers	2,353	19.0	30.4	11.4	60.0
Biological scientists	2,445	25.0	37.9	12.9	51.6
Buyers (wholesale and retail trade)	4,304	32.9	40.0	7.1	21.6
Buyers and shippers (farm products)	592	0.0	0.0	0.0	0.0
Chemical technicians	235	13.0	21.1	8.1	62.3
Chemists	1,428	10.1	14.4	4.3	42.6
Civil engineers	48	0.6	1.9	1.3	216.7
College and university faculty[6]	4,350	NA	16.8	NA	NA
Cooperative Extension Services personnel[7]	6,463	NA	34.7	NA	NA
Credit and collection managers	378	23.9	36.7	12.8	53.6
Dietitians	41,715	90.9	94.0	3.1	3.4
Economists	675	11.8	22.9	11.1	94.1
Editors and reporters	1,457	41.1	42.4	1.3	3.2
Engineers, nec[8] (agricultural engineers)	156	0.0	2.3	2.3	NC
Estimators and investigators, nec	7,213	43.4	53.4	10.0	23.0
Expediters and product controllers	3,086	23.1	32.1	9.0	39.0
Farm management advisers (except Extension personnel)	313	15.4	36.4	21.0	136.4
Farm managers	800	3.3	11.4	8.1	245.5
Farmers (owners and tenants)	13,391	6.0	8.9	2.9	48.3
Food service workers, nec (except private)	14,769	73.8	74.7	0.9	1.2
Foresters and conservationists	2,656	4.2	6.9	2.7	64.3
Gardeners and groundskeepers (except farm)	554	2.2	5.9	3.7	168.2
Health aides (except nursing)	5,584	79.1	86.3	7.2	9.1
Health technicians/technologists, nec	5,046	58.2	60.2	2.0	3.4
Industrial engineers	416	2.4	8.7	6.3	262.5
Inspectors (public administration--except construction)	2,006	6.2	15.3	9.1	146.8
Inspectors, scalers, and graders (log and lumber)	2,906	8.7	15.0	6.3	72.4
Insurance adjusters, examiners, and investigators	9,066	34.3	51.5	17.2	50.1
Insurance agents, brokers and underwriters	1,565	11.6	20.3	8.7	75.0

See footnotes at end of table.

Table 11. — Trends related to occupational employment of females with baccalaureate or higher degrees in food and agricultural specializations[1] — Continued

OES-census-occupation[2]	Females with baccalaureate or higher degrees in food and agricultural specializations				
	Number employed 1976	Percent of occupational employment[3]		Change in percent from 1972-1978	Percent relative change from 1972-1978[4]
		1972	1978		
Managers and administrators, nec	24,469	12.1	16.6	4.5	37.2
Marine scientists	0	0.0	20.0	20.0	NC
Mechanical engineers	61	0.0	0.9	0.9	NC
Officials and administrators, nec (public administrators)	3,538	20.4	24.8	4.4	21.6
Purchasing agents and buyers, nec	1,515	13.3	24.3	11.0	82.7
Real estate agents and brokers	3,715	36.7	45.0	8.3	22.6
Real estate appraisers	143	4.6	12.9	8.3	180.4
Recreation workers	5,396	44.6	57.0	12.4	27.8
Restaurant, cafeteria, and bar managers	1,931	32.4	33.8	1.4	4.3
Sales managers and department heads (retail)	7,745	27.4	37.3	9.9	36.1
Sales managers (except retail)	1,254	2.9	7.0	4.1	141.4
Sales workers and sales clerks, nec	22,590	44.2	46.4	2.2	5.0
Secondary/post-secondary vocational agriculture teachers[9]	676	NA	35.0	NA	NA
Statisticians	267	38.1	47.8	9.7	25.5
Stock and bond sales agents	2,083	9.9	18.3	8.4	84.8
Surveyors	27	0.0	2.4	2.4	NC
Urban and regional planners	144	8.3	11.8	3.5	42.2
Veterinarians	2,642	8.7	15.4	6.7	77.0

NA = not available
NC = not computable

[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Percent of workers in each selected OES-census-based occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations who are female.

[4] Percent relative change equals 1978 percent of occupational employment minus 1972 percent of occupational employment, divided by 1972 percent of occupational employment, and multiplied by 100.

[5] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[6] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[7] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981.

[8] nec = not elsewhere classified.

[9] 1979 data provided by the Office of Vocational and Adult Education, DOED.

Table 12.—Trends related to occupational employment of males with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Males with baccalaureate or higher degrees in food and agricultural specializations				
	Number employed 1976	Percent of occupational employment[3]		Change in percent from 1972-1978	Percent relative change from 1972-1978[4]
		1972	1978		
Adult educators	990	62.3	50.6	-11.7	-18.8
Agricultural and biological technicians (except health)	14,515	70.7	68.1	-2.6	-3.7
Agricultural scientists	19,376	100.0	89.5	-10.5	-10.5
Architects (landscape)[5]	12,584	97.0	94.2	-2.8	-2.9
Assessors, controllers, treasurers (local public administration)	460	65.5	50.0	-15.5	-23.7
Bank officers and financial managers	7,179	81.0	69.6	-11.4	-14.1
Biological scientists	7,959	75.0	62.1	-12.9	-17.2
Buyers (wholesale and retail trade)	9,232	67.1	60.0	-7.1	-10.6
Buyers and shippers (farm products)	15,407	100.0	100.0	0.0	0.0
Chemical technicians	1,777	87.0	78.9	-8.1	-9.3
Chemists	11,098	89.9	85.6	-4.3	-4.8
Civil engineers	3,644	99.4	98.1	-1.3	-1.3
College and university faculty[6]	21,547	NA	83.2	NA	NA
Cooperative Extension Services personnel[7]	12,137	NA	65.3	NA	NA
Credit and collection managers	576	76.1	63.3	-12.8	-16.8
Dietitians	4,075	9.1	6.0	-3.1	-34.1
Economists	4,015	88.2	77.1	-11.1	-12.6
Editors and reporters	1,717	58.9	57.6	-1.3	-2.2
Engineers, nec[8] (agricultural engineers)	11,844	100.0	97.7	-2.3	-2.3
Estimators and investigators, nec	7,627	56.6	46.6	-10.0	-17.7
Expediters and product controllers	7,202	76.9	67.9	-9.0	-11.7
Farm management advisers (except Extension personnel)	937	84.6	63.6	-21.0	-24.8
Farm managers	19,200	96.7	88.6	-8.1	-8.4
Farmers (owners and tenants)	209,802	94.0	91.1	-2.9	-3.1
Food service workers, nec (except private)	4,437	26.2	25.3	-0.9	-3.4
Foresters and conservationists	46,531	95.8	93.1	-2.7	-2.8
Gardeners and groundskeepers (except farm)	14,422	97.8	94.1	-3.7	-3.8
Health aides (except nursing)	1,080	20.9	13.7	-7.2	-34.4
Health technicians/technologists, nec	2,913	41.8	39.8	-2.0	-4.8
Industrial engineers	8,834	97.6	91.3	-6.3	-6.5
Inspectors (public administration--except construction)	20,787	93.8	84.7	-9.1	-9.7
Inspectors, scalers, and graders (log and lumber)	15,488	91.3	85.0	-6.3	-6.9

See footnotes at end of table.

Table 12.—Trends related to occupational employment of males with baccalaureate or higher degrees in food and agricultural specializations[1]—Continued

OES-census-occupation[2]	Males with baccalaureate or higher degrees in food and agricultural specializations				
	Number employed 1976	Percent of occupational employment[3]		Change in percent from 1972-1978	Percent relative change from 1972-1978[4]
		1972	1978		
Insurance adjusters, examiners, and investigators	8,607	65.7	48.5	-17.2	-26.2
Insurance agents, brokers, and underwriters	7,982	88.4	79.7	-8.7	-9.8
Managers and administrators, nec	144,284	87.9	83.4	-4.5	-5.1
Marine scientists	600	100.0	80.0	-20.0	-20.0
Mechanical engineers	12,157	100.0	99.1	-0.9	-0.9
Officials and administrators, nec (public administrators)	11,205	79.6	75.2	-4.4	-5.5
Purchasing agents and buyers, nec	6,136	86.7	75.7	-11.0	-12.7
Real estate agents and brokers	5,303	63.3	55.0	-8.3	-13.1
Real estate appraisers	1,137	95.4	87.1	-8.3	-8.7
Recreation workers	4,053	55.4	43.0	-12.4	-22.4
Restaurant, cafeteria, and bar managers	3,585	67.6	66.2	-1.4	-2.1
Sales managers and department heads (retail)	14,133	72.6	62.7	-9.9	-13.6
Sales managers (except retail)	26,015	97.1	93.0	-4.1	-4.2
Sales workers and sales clerks, nec	27,166	55.8	53.6	-2.2	-3.9
Secondary/post-secondary vocational agriculture teachers[9]	12,122	NA	65.0	NA	NA
Statisticians	564	61.9	52.2	-9.7	-15.7
Stock and bond sales agents	15,130	90.1	81.7	-8.4	-9.3
Surveyors	1,902	100.0	97.6	-2.4	-2.4
Urban and regional planners	2,148	91.7	88.2	-3.5	-3.8
Veterinarians	22,051	91.3	84.6	-6.7	-7.3

NA = not available

[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Percent of workers in each selected OES-census-based occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations who are male.

[4] Percent relative change equals 1978 percent of occupational employment minus 1972 percent of occupational employment, divided by 1972 percent of occupational employment, and multiplied by 100.

[5] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[6] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[7] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981.

[8] nec = not elsewhere classified.

[9] 1979 data provided by the Office of Vocational and Adult Education, DOED.

CHAPTER IV

MINORITY STATUS OF STUDENTS IN HIGHER EDUCATION IN THE FOOD AND AGRICULTURAL SCIENCES AND OF WORKERS IN FOOD AND AGRICULTURAL OCCUPATIONS

As with chapter III, the purpose of this chapter is twofold. It presents data on the minority status of students enrolled in the food and agricultural sciences by field of study. It also presents data on occupational employment of food and agricultural professionals, classified by minority status. Statistical tables address: number of minority and of nonminority students at the baccalaureate, master's, and doctoral levels; number and percent of minority and nonminority workers in food and agricultural occupations; and trends related to employment of workers in food and agricultural occupations, classified by minority status.

Primary sources of data included in this chapter were a USDA-funded Clemson University survey and the Bureau of Labor Statistics. Supplemental sources of data are cited in the footnotes in the appropriate tables.

Tables 13-16 present data on the minority status of students enrolled in degree specializations in the food and agricultural sciences. These 1979 data represent findings from a USDA-funded Clemson University survey for which the response rate was 70 percent for Colleges of Agriculture and Natural Resources, 50 percent for Colleges of Home Economics, and 47 percent for Schools of Forestry. For purposes of comparison in this study, all Clemson University sample data were adjusted to represent a 70 percent response rate. Because many institutions with sizeable minority enrollments did not participate in the Clemson University survey, it was deemed inadvisable to adjust the data to reflect a 100 percent response rate. Therefore, it is essential to note that minority enrollment unquestionably exceeds that reported in tables 13-16.

As shown in tables 13-16, findings derived from the study for minority status of students in the food and agricultural sciences include the following:

1. At the baccalaureate level--
    - minority students are enrolled in virtually all food and agricultural degree specializations,
    - the greatest number of minority students are enrolled in courses in foods and nutrition, forestry, animal science, general agriculture, agricultural business, food science and technology, and horticulture (fruit and vegetable),
    - degree specializations with the largest percent of minority students include marine biology, soil science, general agriculture, foods and nutrition, agricultural business, and food science and technology.
2. At the master's level--
    - minority students are enrolled in more than 80 percent of the degree specializations comprising the food and agricultural sciences,

- the greatest number of minority students are enrolled in veterinary medicine specialties, foods and nutrition, food science and technology, forestry, agronomy, agricultural business, and agricultural education,
- degree specializations with the largest percent of minority students include agricultural business, agricultural communications/journalism, veterinary medicine specialties, dairy science, agronomy, and poultry science.

3. At the doctoral level--
    - minority students are enrolled in two-thirds of the various degree specializations,
    - the greatest number of minority students are enrolled in veterinary medicine (D.V.M.), veterinary medicine specialties, foods and nutrition, food science and technology, agronomy, plant pathology, and horticulture (fruit and vegetable),
    - degree specializations with the largest percent of minority students include poultry science, horticulture (ornamental), institution and cafeteria management, veterinary medicine specialties, dairy science, and foods and nutrition.

Tables 17-24 present data on the minority status of workers in food and agricultural occupations. Findings associated with this phase of the study are as follows:

1. The greatest number of minorities are employed as dietitians, farmers, managers or administrators, food service workers, gardeners or groundskeepers (such as landscape gardeners), sales workers or sales clerks, and inspectors (public administrators).
2. Historical data for 1972 through 1978 reveal that the percent of minority employment increased for 38 of the 52 occupations studied. It decreased for 12 occupations. The most notable percent increments were for the occupations of farm management advisor, estimator or investigator, insurance adjuster or examiner or investigator, recreation worker, and biological scientist.
3. Minorities experienced the greatest percent relative increment from 1972 through 1978 in employment as sales managers or department heads, farm management advisors, industrial engineers, engineers, estimators or investigators, and insurance agents, brokers, or underwriters.
4. The greatest number of female minorities are employed as dietitians, food service workers, insurance adjustors/examiners/investigators, managers or administrators, health aides, and sales workers or sales clerks.
5. The greatest percent increments from 1972 through 1978 for female minorities were in employment as inspectors/scalers/graders (log and number), farm management advisers, dietitians, estimators or investigators, and recreation workers.

6. The greatest number of male minorities are employed as farmers, managers or administrators, gardeners or groundskeepers (such as landscape gardeners), inspectors, foresters or conservationists, and agricultural or biological technicians.

7. The greatest percent increments from 1972 through 1978 for male minorities were in employment as veterinarians, chemists, economists, real estate appraisers, civil engineers, engineers, and assessors/controllers/treasurers.

Table 13.—Student enrollment at the baccalaureate and higher levels in food and agricultural specializations by minority status (sample = 70% population)[1]

Degree specialization	Enrollment by degree level[2]											
	Baccalaureate				Master's				Doctoral			
	Minority[3]		Nonminority[4]		Minority[3]		Nonminority[4]		Minority[3]		Nonminority[4]	
	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent	Frequency	Percent
Agriculture, general	328	5.2	5,964	94.8	12	4.4	262	95.6	0	0.0	2	100.0
Agricultural business	314	4.4	6,769	95.6	59	12.1	428	87.9	5	2.6	187	97.4
Agricultural economics	114	2.8	4,002	97.2	0	0.0	997	100.0	0	0.0	530	100.0
Agricultural education	55	1.5	3,599	98.5	56	4.8	1,115	95.2	12	6.2	181	93.8
Agricultural engineering	110	2.6	4,136	97.4	18	5.1	332	94.9	6	3.9	149	96.1
Agriculture and farm management	3	0.7	455	99.3	0	0.0	20	100.0	0	0.0	2	100.0
Agronomy	141	2.8	4,843	97.2	73	6.7	1,018	93.3	28	3.9	685	96.1
Animal science	346	2.3	14,382	97.7	28	2.0	1,350	98.0	9	1.5	603	98.5
Dairy science	27	2.8	940	97.2	12	7.5	149	92.5	8	8.6	85	91.4
Entomology	4	1.8	219	98.2	6	3.5	165	96.5	8	6.8	110	93.2
Fish, game, wildlife management	57	1.3	4,173	98.7	14	1.9	720	98.1	0	0.0	192	100.0
Food science and technology	163	4.1	3,831	95.9	88	5.4	1,525	94.6	29	5.0	564	95.0
Foods and nutrition	627	4.8	12,522	95.2	93	5.1	1,729	94.9	39	8.4	427	91.6
Forestry	351	1.7	20,805	98.3	73	3.3	2,116	96.7	15	2.1	698	97.9
Horticulture, fruit and vegetable	157	2.4	6,348	97.6	37	4.1	861	95.9	17	4.1	397	95.9
Horticulture, ornamental	101	3.2	3,048	96.8	2	0.9	227	99.1	4	10.3	35	89.7
Institution and cafeteria management	42	1.7	2,430	98.3	10	6.0	153	94.0	1	9.1	14	90.9
Landscape architecture	68	2.9	2,290	97.1	2	1.4	139	98.6	0	0.0	1	100.0
Marine biology	1	16.7	5	83.3	0	0.0	0	0.0	0	0.0	0	0.0
Natural resources management	23	2.6	866	97.4	5	1.5	324	98.5	0	0.0	49	100.0
Parks and recreation management	14	0.7	1,998	99.3	0	0.0	144	100.0	0	0.0	43	100.0
Plant pathology	6	1.2	500	98.8	17	2.9	564	97.1	20	4.3	441	95.7
Plant physiology	0	0.0	0	0.0	0	0.0	59	100.0	3	2.5	116	97.5
Poultry science	15	3.4	426	96.6	9	6.6	127	93.4	12	15.8	64	84.2
Range management	6	1.0	608	99.0	2	1.9	103	98.1	1	2.0	48	98.0
Soil science	107	5.8	1,744	94.2	15	3.0	484	97.0	7	1.9	365	98.1
Veterinary medicine (pre-professional)	100	2.3	4,182	97.7	0	0.0	37	100.0	0	0.0	35	100.0
Veterinary medicine (D.V.M.)[5]	N	N	N	N	N	N	N	N	248	4.4	5,462	95.6
Veterinary medicine specialties (post-D.V.M.)	N	N	N	N	104	9.1	1,030	90.9	63	9.0	637	91.0
Other (agricultural communications/journalism)	16	1.9	840	98.1	4	9.8	97	90.2	0	0.0	0	0.0

N = not applicable

[1] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[2] Sample response rates to the Clemson University survey varied among Colleges of Agriculture and Natural Resources (.700), Schools of Forestry (.471), Schools of Veterinary Medicine (.500), and Colleges of Home Economics (.503). For purposes of comparison, all sample data from the Clemson University survey presented in Table 13 for forestry, veterinary medicine, and home economics have been adjusted to represent a 70 percent response rate.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Hispanics.

[4] Includes Non-Hispanic Whites.

[5] Fall, 1980 data provided by the Association of American Veterinary Medical Colleges; population data adjusted to represent a 70 percent sample to facilitate comparison.

Table 14. —Baccalaureate enrollment in food and agricultural specializations ranked by field of study and by minority status (sample = 70% population)[1]

Degree specialization	Baccalaureate enrollment[2]					
	Total		Minority[3]		Nonminority[4]	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Forestry	21,156	1.0	351	2.0	20,805	1.0
Animal science	14,728	2.0	346	3.0	14,382	2.0
Foods and nutrition	13,150	3.0	627	1.0	12,522	3.0
Agricultural business	7,083	4.0	314	5.0	6,769	4.0
Horticulture, fruit and vegetable	6,505	5.0	157	7.0	6,348	5.0
Agriculture, general	6,292	6.0	328	4.0	5,964	6.0
Agronomy	4,984	7.0	141	8.0	4,843	7.0
Veterinary medicine (pre-professional)	4,282	8.0	100	13.0	4,182	8.0
Agricultural engineering	4,246	9.0	110	10.0	4,136	10.0
Fish, game, wildlife management	4,230	10.0	57	15.0	4,173	9.0
Agricultural economics	4,116	11.0	114	9.0	4,002	11.0
Food science and technology	3,994	12.0	163	6.0	3,831	12.0
Agricultural education	3,654	13.0	55	16.0	3,599	13.0
Horticulture, ornamental	3,149	14.0	101	12.0	3,048	14.0
Institution and cafeteria management	2,472	15.0	42	17.0	2,430	15.0
Landscape architecture	2,358	16.0	68	14.0	2,290	16.0
Parks and recreation management	2,012	17.0	14	22.0	1,998	17.0
Soil science	1,851	18.0	107	11.0	1,744	18.0
Dairy science	967	19.0	27	18.0	940	19.0
Natural resources management	889	20.0	23	19.0	866	20.0
Other (agricultural communications/ journalism)	856	21.0	16	20.0	840	21.0
Range management	614	22.0	6	23.5	608	22.0
Plant pathology	506	23.0	6	23.5	500	23.0
Agriculture and farm management	458	24.0	3	26.0	455	24.0
Poultry science	441	25.0	15	21.0	426	25.0
Entomology	223	26.0	4	25.0	219	26.0
Marine biology	6	27.0	1	27.0	5	27.0
Plant physiology	0	28.0	0	28.0	0	28.0

N = not applicable

[1] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[2] Sample response rates to the Clemson University survey varied among Colleges of Agriculture and Natural Resources (.700), Schools of Forestry (.471), Schools of Veterinary Medicine (.500), and Colleges of Home Economics (.503). For purposes of comparison, all sample data from the Clemson University survey presented in Table 14 for forestry, veterinary medicine, and home economics have been adjusted to represent a 70 percent response rate.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Hispanics.

[4] Includes Non-Hispanic Whites.

Table 15. —Master's enrollment in food and agricultural specializations ranked by field of study and by minority status (sample = 70% population)[1]

Degree specialization	Master's enrollment[2]					
	Total		Minority[3]		Nonminority[4]	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Forestry	2,189	1.0	73	4.0	2,116	1.0
Foods and nutrition	1,823	2.0	93	2.0	1,729	2.0
Food science and technology	1,613	3.0	88	3.0	1,525	3.0
Animal science	1,378	4.0	28	9.0	1,350	4.0
Agricultural education	1,171	5.0	56	7.0	1,115	5.0
Veterinary medicine specialties (post-D.V.M.)	1,134	6.0	104	1.0	1,030	6.0
Agronomy	1,091	7.0	73	5.0	1,018	7.0
Agricultural economics	997	8.0	0	26.5	997	8.0
Horticulture, fruit and vegetable	898	9.0	37	8.0	861	9.0
Fish, game, wildlife management	734	10.0	14	13.0	720	10.0
Plant pathology	581	11.0	17	11.0	564	11.0
Soil science	499	12.0	15	12.0	484	12.0
Agricultural business	487	13.0	59	6.0	428	13.0
Agricultural engineering	350	14.0	18	10.0	332	14.0
Natural resources management	329	15.0	5	19.0	324	15.0
Agriculture, general	274	16.0	12	14.5	262	16.0
Horticulture, ornamental	229	17.0	2	22.0	227	17.0
Entomology	171	18.0	6	18.0	165	18.0
Institution and cafeteria management	163	19.0	10	16.0	153	19.0
Dairy science	161	20.0	12	14.5	149	20.0
Parks and recreation management	144	21.0	0	27.0	144	21.0
Landscape architecture	141	22.0	2	22.0	139	22.0
Poultry science	136	23.0	9	17.0	127	23.0
Range management	105	24.0	2	22.0	103	24.0
Plant physiology	59	25.0	0	26.5	59	25.0
Other (agricultural communications/ journalism)	41	26.0	4	20.0	37	26.5
Veterinary medicine (pre-professional)	37	27.0	0	26.5	37	26.5
Agriculture and farm management	20	28.0	0	26.5	20	28.0
Marine biology	0	29.0	0	26.5	0	29.0

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[1] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[2] Sample response rates to the Clemson University survey varied among Colleges of Agriculture and Natural Resources (.700), Schools of Forestry (.471), Schools of Veterinary Medicine (.500), and Colleges of Home Economics (.503). For purposes of comparison, all sample data from the Clemson University survey presented in Table 15 for forestry, veterinary medicine, and home economics have been adjusted to represent a 70 percent response rate.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Hispanics.

[4] Includes Non-Hispanic Whites.

Table 16.—Doctoral enrollment in food and agricultural specializations ranked by field of study and by minority status (sample = 70% population)[1]

Degree specialization	Doctoral enrollment[2]					
	Total		Minority[3]		Nonminority[4]	
	Frequency	Rank	Frequency	Rank	Frequency	Rank
Veterinary medicine (D.V.M.)[5]	5,711	1.0	248	1.0	5,642	1.0
Forestry	713	2.0	15	8.0	698	2.0
Agronomy	713	3.0	28	5.0	685	3.0
Veterinary medicine specialties (post-D.V.M.)	700	4.0	63	2.0	637	4.0
Animal science	612	5.0	9	11.0	603	5.0
Food science and technology	593	6.0	29	4.0	564	6.0
Agricultural economics	530	7.0	0	25.5	530	7.0
Foods and nutrition	446	8.0	39	3.0	427	9.0
Plant pathology	461	9.0	20	6.0	441	8.0
Horticulture, fruit and vegetable	414	10.0	17	7.0	397	10.0
Soil science	372	11.0	7	14.0	365	11.0
Agricultural education	193	12.0	12	9.5	181	14.0
Agricultural business	192	13.5	5	16.0	187	13.0
Fish, game, wildlife management	192	13.5	0	25.5	192	12.0
Agricultural engineering	155	15.0	6	15.0	149	15.0
Plant physiology	119	16.0	3	18.0	116	16.0
Entomology	118	17.0	8	12.5	110	17.0
Dairy science	93	18.0	8	12.5	85	18.0
Poultry science	76	19.0	12	9.5	64	19.0
Natural resources management	49	20.5	0	25.5	49	20.0
Range management	49	20.5	1	20.0	48	21.0
Parks and recreation management	43	22.0	0	25.5	43	22.0
Horticulture, ornamental	39	23.0	4	17.0	35	23.5
Veterinary medicine (pre-professional)	35	24.0	0	25.5	35	23.5
Institution and cafeteria management	15	25.0	1	19.0	14	25.0
Agriculture, general	2	26.5	0	25.5	2	26.5
Agriculture and farm management	2	26.5	0	25.5	2	26.5
Landscape architecture	1	28.0	0	25.5	1	28.0
Marine biology	0	29.5	0	25.5	0	29.5
Other (agricultural communications/ journalism)	0	29.5	0	25.5	0	29.5

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[1] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[2] Sample response rates to the Clemson University survey varied among Colleges of Agriculture and Natural Resources (.700), Schools of Forestry (.471), Schools of Veterinary Medicine (.500), and Colleges of Home Economics (.503). For purposes of comparison, all sample data from the Clemson University survey presented in Table 16 for forestry, veterinary medicine, and home economics have been adjusted to represent a 70 percent response rate.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Hispanics.

[4] Includes Non-Hispanic Whites.

[5] Fall 1980 data provided by the Association of American Veterinary Medical Colleges; population data adjusted to represent a 70 percent sample to facilitate comparison.

Table 17.—Occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations by minority status[1]

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations			
	Minority[3]		Nonminority[4]	
	Frequency	Percent	Frequency	Percent
Adult educators	179	10.7	1,501	89.3
Agricultural and biological technicians (except health)	1,621	6.7	22,571	93.3
Agricultural scientists	0	0.0	20,396	100.0
Architects (landscape)[5]	624	4.8	12,376	95.2
Assessors, controllers, treasurers (local public administration)	0	0.0	718	100.0
Bank officers and financial managers	437	4.6	9,095	95.4
Biological scientists	1,228	11.8	9,176	88.2
Buyers (wholesale and retail trade)	690	5.1	12,846	94.9
Buyers and shippers (farm products)	0	0.0	15,999	100.0
Chemical technicians	209	10.4	1,803	89.6
Chemists	914	7.3	11,612	92.7
Civil engineers	240	6.5	3,452	93.5
College and university faculty[6]	1,254	4.8	24,643	95.2
Cooperative Extension Services personnel[7]	1,525	8.6	16,246	91.4
Credit and collection managers	54	5.7	900	94.3
Dietitians	9,158	20.0	36,632	80.0
Economists	408	8.7	4,282	91.3
Editors and reporters	191	6.0	2,983	94.0
Engineers, nec[8] (agricultural engineers)	828	6.9	11,172	93.1
Estimators and investigators, nec	1,291	8.7	13,549	91.3
Expediters and product controllers	947	9.2	9,341	90.8
Farm management advisers (except Extension personnel)	104	8.3	1,146	91.7
Farm managers	0	0.0	20,000	100.0
Farmers (owners and tenants)	6,919	3.1	216,274	96.9
Food service workers, nec (except private)	4,071	21.2	15,135	78.8
Foresters and conservationists	1,328	2.7	47,859	97.3
Gardeners and groundskeepers (except farm)	2,651	17.7	12,325	82.3
Health aides (except nursing)	1,399	21.0	5,265	79.0
Health technicians/technologists, nec	923	11.6	7,036	88.4
Industrial engineers	185	2.0	9,065	98.0
Inspectors (public administration--except construction)	2,006	8.8	20,787	91.2
Inspectors, scalers, and graders (log and lumber)	975	5.3	17,419	94.7

See footnotes at end of table.

Table 19.—Female workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by minority status[1]

Oes-census-occupation[2]	Minority[3] Number employed	Minority[3] Rank by number employed	Minority[3] Percent employment[5]	Minority[3] Rank by percent employment	Nonminority[4] Number employed	Nonminority[4] Rank by number employed	Nonminority[4] Percent employment[6]	Nonminority[4] Rank by percent employment
Dietitians	9,158	1.0	29.0	1.0	32,557	1.0	71.1	1.0
Food service workers, nec[7] (except private)	3,207	2.0	16.7	3.0	11,562	5.0	60.2	3.0
Insurance adjusters, examiners, and investigators	1,361	3.0	7.7	6.0	7,705	7.0	43.6	6.0
Managers and administrators, nec	1,350	4.0	0.8	30.0	23,119	2.0	13.7	28.0
Health aides (except nursing)	1,166	5.0	17.5	2.0	4,418	12.0	66.3	2.0
Sales workers and sales clerks, nec	1,095	6.0	2.2	19.0	21,495	3.0	43.2	8.0
Estimators and investigators, nec	965	7.0	6.5	8.0	6,248	9.0	42.1	9.0
Recreation workers	794	8.0	8.4	5.0	4,602	11.0	48.7	5.0
Cooperative Extension Services personnel[8]	784	9.0	4.4	9.0	5,364	10.0	30.2	17.0
Health technicians/technologists, nec	780	10.0	9.8	4.0	4,266	13.0	53.6	4.0
Agricultural and biological technicians	532	11.0	2.2	20.0	9,145	6.0	37.8	11.0
Biological scientists	406	12.0	3.9	10.0	2,039	23.0	19.6	24.0
Officials and administrators, nec (public administrators)	398	13.0	2.7	18.0	3,140	16.0	21.3	23.0
Expediters and product controllers	350	14.0	3.4	14.0	2,736	18.0	26.6	20.0
Buyers (wholesale and retail trade)	257	15.0	1.9	21.0	4,047	14.0	29.9	18.0
Farmers (owners and tenants)	223	16.0	0.1	36.0	13,168	4.0	5.9	37.0
Inspectors (public administration--except construction)	205	17.0	0.9	28.0	1,801	24.0	7.9	33.0
Chemists	200	18.0	1.6	23.0	1,228	29.0	9.8	32.0
Sales managers and department heads (retail)	197	19.0	0.9	27.0	7,548	8.0	34.5	14.0
Sales managers (except retail)	191	20.0	0.7	31.0	1,063	30.0	3.9	42.0
Restaurant, cafeteria, and bar managers	177	21.0	3.2	15.0	1,754	25.0	31.8	16.0
Bank officers and financial managers	142	22.0	1.5	24.0	2,211	21.0	23.2	22.0

See footnotes at end of table.

Table 18.—Workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by minority status[1]

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations									
	Total employment		Minority employment[3]				Nonminority employment[4]			
	Number employed	Rank by number employed	Number employed	Rank by number employed	Percent employ-ment	Rank by percent employ-ment	Number employed	Rank by number employed	Percent employ-ment	Rank by percent employ-ment
Farmers (owners and tenants)	223,193	1.0	6,919	2.0	3.1	39.0	216,274	1.0	96.9	14.0
Managers and administrators, nec[5]	168,753	2.0	6,075	3.0	3.6	38.0	162,678	2.0	96.4	15.0
Sales workers and sales clerks, nec	49,756	3.0	2,190	6.0	4.4	35.0	47,566	4.0	95.6	18.0
Foresters and conservationists	49,187	4.0	1,328	14.0	2.7	41.0	47,859	3.0	97.3	12.0
Dietitians	45,790	5.0	9,158	1.0	20.0	3.0	36,632	5.0	80.0	50.0
Sales managers (except retail)	27,269	6.0	627	27.0	2.3	43.0	26,642	6.0	97.7	10.0
College and university faculty[6]	25,897	7.0	1,254	16.0	4.8	32.0	24,643	8.0	95.2	22.0
Veterinarians	24,693	8.0	0	49.0	0.0	49.0	24,693	7.0	100.0	4.0
Agricultural and biological technicians (except health)	24,192	9.0	1,621	9.0	6.7	24.0	22,571	9.0	93.3	29.0
Inspectors (public administration--except construction)	22,793	10.0	2,006	7.0	8.8	14.0	20,787	11.0	91.2	39.0
Sales managers and department heads (retail)	21,878	11.0	875	23.0	4.0	37.0	21,003	10.0	96.0	16.0
Agricultural scientists	20,396	12.0	0	49.0	0.0	49.0	20,396	12.0	100.0	4.0
Farm managers	20,000	13.0	0	49.0	0.0	49.0	20,000	13.0	100.0	4.0
Food service workers, nec (except private)	19,206	14.0	4,871	4.0	21.2	1.0	15,135	19.0	78.8	52.0
Inspectors, scalers, and graders (log and lumber)	18,394	15.0	975	19.0	5.3	29.0	17,419	14.0	94.7	24.0
Cooperative Extension Services personnel[7]	17,771	16.0	1,525	10.0	8.6	17.0	16,246	16.0	91.4	36.0
Insurance adjusters, examiners, and investigators	17,673	17.0	1,820	8.0	10.3	11.0	15,853	18.0	89.7	42.0
Stock and bond sales agents	17,213	18.0	189	38.0	1.1	45.0	17,024	15.0	98.9	8.0
Buyers and shippers (farm products)	15,999	19.0	0	49.0	0.0	49.0	15,999	17.0	100.0	4.0
Gardeners and groundskeepers (except farm)	14,976	20.0	2,651	5.0	17.7	4.0	12,325	24.0	82.3	49.0
Estimators and investigators, nec	14,840	21.0	1,291	15.0	8.7	15.0	13,549	20.0	91.3	38.0
Officials and administrators, nec (public administrators)	14,743	22.0	1,371	13.0	9.3	12.0	13,372	21.0	90.7	41.0
Buyers (wholesale and retail trade)	13,536	23.0	690	26.0	5.1	30.0	12,846	22.0	94.9	23.0
Architects (landscape)[8]	13,000	24.0	624	28.0	4.8	33.0	12,376	23.0	95.2	21.0
Secondary/post-secondary vocational agriculture teachers[9]	12,800	25.0	1,073	18.0	8.4	18.0	11,727	25.0	91.6	35.0
Chemists	12,526	26.0	914	22.0	7.3	21.0	11,612	26.0	92.7	32.0
Mechanical engineers	12,218	27.0	855	24.0	7.0	22.0	11,363	27.0	93.0	31.0
Engineers, nec (agricultural engineers)	12,000	28.0	828	25.0	6.9	23.0	11,172	28.0	93.1	30.0
Biological scientists	10,484	29.0	1,228	17.0	11.8	6.0	9,176	30.0	88.2	47.0

See footnotes at end of table.

Table 18.—Workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by minority status[1]—Continued

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations									
	Total employment		Minority employment[3]				Nonminority employment[4]			
	Number employed	Rank by number employed	Number employed	Rank by number employed	Percent employment	Rank by percent employment	Number employed	Rank by number employed	Percent employment	Rank by percent employment
Expediters and product controllers	10,288	30.0	947	20.0	9.2	13.0	9,341	29.0	90.8	40.0
Insurance agents, brokers, and underwriters	9,547	31.0	429	31.0	4.5	34.0	9,118	31.0	95.5	19.0
Bank officers and financial managers	9,532	32.0	437	29.0	4.6	33.0	9,095	32.0	95.4	20.0
Recreation workers	9,449	33.0	1,427	11.0	15.1	5.0	8,022	35.0	84.9	48.0
Industrial engineers	9,250	34.0	185	39.0	2.0	44.0	9,065	33.0	98.0	9.0
Real estate agents and brokers	9,018	35.0	243	34.0	2.7	42.0	8,775	34.0	97.3	11.0
Health technicians/technologists, nec	7,959	36.0	923	21.0	11.6	7.0	7,036	37.0	88.4	46.0
Purchasing agents and buyers, nec	7,651	37.0	322	33.0	4.2	36.0	7,329	36.0	95.8	17.0
Health aides (except nursing)	6,664	38.0	1,399	12.0	21.0	2.0	5,265	38.0	79.0	51.0
Restaurant, cafeteria, and bar managers	5,516	39.0	436	30.0	7.9	20.0	5,080	39.0	92.1	33.0
Economists	4,690	40.0	408	32.0	8.7	16.0	4,282	40.0	91.3	37.0
Civil engineers	3,692	41.0	240	35.0	6.5	25.0	3,452	41.0	93.5	28.0
Editors and reporters	3,174	42.0	191	37.0	6.0	27.0	2,983	42.0	94.0	26.0
Urban and regional planners	2,292	43.0	144	41.0	6.3	26.0	2,148	43.0	93.7	27.0
Chemical technicians	2,012	44.0	209	36.0	10.4	10.0	1,803	45.0	89.6	43.0
Surveyors	1,929	45.0	0	49.0	0.0	49.0	1,929	44.0	100.0	4.0
Adult educators	1,680	46.0	179	40.0	10.7	9.0	1,501	46.0	89.3	44.0
Real estate appraisers	1,520	47.0	47	45.0	3.1	40.0	1,473	47.0	96.9	13.0
Farm management advisers (except Extension personnel)	1,250	48.0	104	42.0	8.3	19.0	1,146	48.0	91.7	34.0
Credit and collection managers	954	49.0	54	44.0	5.7	28.0	900	49.0	94.3	25.0
Statisticians	831	50.0	89	43.0	10.7	8.0	742	50.0	89.3	45.0
Assessors, controllers, treasurers (local public administration)	718	51.0	0	49.0	0.0	49.0	718	51.0	100.0	4.0
Marine scientists	600	52.0	0	49.0	0.0	49.0	600	52.0	100.0	4.0

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[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Includes Whites and White-Hispanics.

[5] nec = not elsewhere classified.

[6] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 5 for detailed data.

[7] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 829 employees for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 7 for detailed data.

[8] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[9] 1979 data provided by the Office of Vocational and Adult Education, DOED.

Table 17.—Occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations by minority status[1]—Continued

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations			
	Minority[3]		Nonminority[4]	
	Frequency	Percent	Frequency	Percent
Insurance adjusters, examiners, and investigators	1,820	10.3	15,853	89.7
Insurance agents, brokers, and underwriters	429	4.5	9,118	95.5
Managers and administrators, nec	6,075	3.6	162,678	96.4
Marine scientists	0	0.0	600	100.0
Mechanical engineers	855	7.0	11,363	93.0
Officials and administrators, nec (public administrators)	1,371	9.3	13,372	90.7
Purchasing agents and buyers, nec	322	4.2	7,329	95.8
Real estate agents and brokers	243	2.7	8.775	97.3
Real estate appraisers	47	3.1	1,473	96.9
Recreation workers	1,427	15.1	8,022	84.9
Restaurant, cafeteria, and bar managers	436	7.9	5,080	92.1
Sales managers and department heads (retail)	875	4.0	21,003	96.0
Sales managers (except retail)	627	2.3	26.642	97.7
Sales workers and sales clerks, nec	2,190	4.4	47,566	95.6
Secondary/post-secondary vocational agriculture teachers[9]	1,073	8.4	11,727	91.6
Statisticians	89	10.7	742	89.3
Stock and bond sales agents	189	1.1	17,024	98.9
Surveyors	0	0.0	1,929	100.0
Urban and regional planners	144	6.3	2,148	93.7
Veterinarians	0	0.0	24,693	100.0

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[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Includes Whites and White-Hispanics.

[5] Source: "Occupational Projections and Training Needs." Bulletin 2020, BLS, DOL, 1979.

[6] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 5 for detailed data.

[7] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 829 employees for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 7 for detailed data.

[8] nec = not elsewhere classified.

[9] 1979 data provided by the Office of Vocational and Adult Education, DOED.

Table 19.—Female workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by minority status[1] — Continued

OES-census-occupation[2]	Female workers with baccalaureate or higher degrees in food and agricultural specializations							
	Minority[3]				Nonminority[4]			
	Number employed	Rank by number employed	Percent employment[5]	Rank by percent employment	Number employed	Rank by number employed	Percent employment[6]	Rank by percent employment
Adult educators	119	23.0	7.1	7.0	571	35.0	34.0	15.0
Insurance agents, brokers, and underwriters	95	24.0	1.0	26.0	1,470	26.0	15.4	27.0
Economists	89	25.0	1.9	22.0	586	34.0	12.5	29.0
Editors and reporters	86	26.0	2.7	17.0	1,371	28.0	43.2	7.0
Real estate agents and brokers	81	27.0	0.9	29.0	3,634	15.0	40.3	10.0
Chemical technicians	78	28.0	3.9	11.0	157	43.0	7.8	34.0
Purchasing agents and buyers, nec	77	29.0	1.0	25.0	1,438	27.0	18.8	25.0
Engineers, nec (agricultural engineers)	72	30.0	0.6	32.0	84	46.0	0.7	48.0
Real estate appraisers	47	31.0	3.1	16.0	96	45.0	6.3	35.0
Industrial engineers	46	32.0	0.5	34.0	370	38.0	4.0	40.5
Gardeners and groundskeepers (except farm)	45	33.0	0.3	35.0	509	36.0	3.4	44.0
Credit and collection managers	36	34.0	3.8	12.0	342	39.0	35.8	13.0
Statisticians	29	35.0	3.5	13.0	238	42.0	28.6	19.0
Civil engineers	22	36.0	0.6	33.0	26	49.0	0.7	47.0
Agricultural scientists	0	44.5	0.0	44.5	1,020	31.0	5.0	39.0
Architects (landscape)[9]	0	44.5	0.0	44.5	416	37.0	3.2	45.0
Assessors, controllers, treasurers (local public administration)	0	44.5	0.0	44.5	258	41.0	35.9	12.0
Buyers and shippers (farm products)	0	44.5	0.0	44.5	592	33.0	3.7	43.0
Farm management advisers (except Extension personnel)	0	44.5	0.0	44.5	313	40.0	25.0	21.0
Farm managers	0	44.5	0.0	44.5	800	32.0	4.0	40.5
Foresters and conservationists	0	44.5	0.0	44.5	2,656	19.0	5.4	38.0
Inspectors, scalers, and graders (log and lumber)	0	44.5	0.0	44.5	2,906	17.0	15.8	26.0

See footnotes at end of table.

Table 19.—Female workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by minority status[1]— Continued

OES-census-occupation[2]	Female workers with baccalaureate or higher degrees in food and agricultural specializations							
	Minority[3]				Nonminority[4]			
	Number employed	Rank by number employed	Percent employment[5]	Rank by percent employment	Number employed	Rank by number employed	Percent employment[6]	Rank by percent employment
Marine scientists	0	44.5	0.0	44.5	0	51.0	0.0	51.0
Mechanical engineers	0	44.5	0.0	44.5	61	47.0	0.5	49.0
Stock and bond sales agents	0	44.5	0.0	44.5	2,083	22.0	12.1	30.0
Surveyors	0	44.5	0.0	44.5	27	48.0	1.4	46.0
Urban and regional planners	0	44.5	0.0	44.5	14	44.0	6.3	36.0
Veterinarians	0	44.5	0.0	44.5	2,642	20.0	10.7	31.0
College and university faculty	NA	NA	NA	NA	NA	NA	NA	NA
Secondary/post-secondary vocational agriculture teachers	NA	NA	NA	NA	NA	NA	NA	NA

NA = not available

[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Includes Whites and White-Hispanics.

[5] Percent of total workers in a given occupation who are minority females.

[6] Percent of total workers in a given occupation who are nonminority females.

[7] nec = not elsewhere classified.

[8] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 315 females for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 7 for detailed data.

[9] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

Table 20.—Male workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by minority status[1]

OES-census-occupation[2]	Male workers with baccalaureate or higher degrees in food and agricultural specializations							
	Minority[3]				Nonminority[4]			
	Number employed	Rank by number employed	Percent employment[5]	Rank by percent employment	Number employed	Rank by number employed	Percent employment[6]	Rank by percent employment
Farmers (owners and tenants)	6,696	1.0	3.0	30.0	203,106	1.0	91.0	13.0
Managers and administrators, nec[7]	4,725	2.0	2.8	31.0	139,559	2.0	82.7	20.0
Gardeners and groundskeepers (except farm)	2,606	3.0	17.4	1.0	11,816	16.0	78.9	24.0
Inspectors (public administration--except construction)	1,801	4.0	7.9	3.0	18,986	9.0	83.3	18.0
Foresters and conservationists	1,328	5.0	2.7	32.0	45,203	3.0	91.9	12.0
Sales workers and sales clerks, nec	1,095	6.0	2.2	34.0	26,071	4.0	52.4	42.0
Agricultural and biological technicians (except health)	1,089	7.0	4.5	19.0	13,426	14.0	55.5	40.0
Inspectors, scalers, and graders (log and lumber)	975	8.0	5.3	16.0	14,513	12.0	78.9	23.0
Officials and administrators, nec (public administrators)	973	9.0	6.6	9.6	10,232	21.0	69.4	28.0
Food service workers, nec (except private)	864	10.0	4.5	20.0	3,573	34.0	18.6	48.0
Mechanical engineers	855	11.0	7.0	6.0	11,302	17.0	92.5	9.0
Biological scientists	822	12.0	7.9	4.0	7,137	27.0	68.6	29.0
Engineers, nec (agricultural engineers)	756	13.0	6.3	11.0	11,088	18.0	92.4	10.0
Cooperative Extension Services personnel[8]	741	14.0	4.2	21.0	10,881	19.0	61.2	35.0
Chemists	714	15.0	5.7	15.0	10,384	20.0	82.9	19.0
Sales managers and department heads (retail)	678	16.0	3.1	28.0	13,455	13.0	61.5	34.0
Recreation workers	633	17.0	6.7	8.0	3,420	36.0	36.2	46.0
Architects (landscape)[9]	624	18.0	4.8	17.0	11,960	15.0	92.0	11.0
Expediters and product controllers	597	19.0	5.8	14.0	6,605	29.0	64.2	32.0

See footnotes at end of table.

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OES-census-occupation[2]	Male workers with baccalaureate or higher degrees in food and agricultural specializations							
	Minority[3]				Nonminority[4]			
	Number employed	Rank by number employed	Percent employment[5]	Rank by percent employment	Number employed	Rank by number employed	Percent employment[6]	Rank by percent employment
Insurance adjusters, examiners, and investigators	459	20.0	2.6	33.0	8,148	24.0	46.1	45.0
Sales managers (except retail)	436	21.0	1.6	39.0	25,579	5.0	93.8	7.0
Buyers (wholesale and retail trade)	433	22.0	3.2	27.0	8,799	22.0	65.0	31.0
Insurance agents, brokers, and underwriters	334	23.0	3.5	23.0	7,648	25.0	80.1	22.0
Estimators and investigators, nec	320	24.0	2.2	35.0	7,301	26.0	49.2	44.0
Economists	319	25.0	6.8	7.0	3,696	33.0	78.8	25.0
Bank officers and financial managers	295	26.0	3.1	29.0	6,884	28.0	72.2	27.0
Restaurant, cafeteria, and bar managers	259	27.0	4.7	18.0	3,326	37.0	60.3	37.0
Purchasing agents and buyers, nec	245	28.0	3.2	26.0	5,891	30.0	77.0	26.0
Health aides (except nursing)	233	29.0	3.5	24.0	847	45.0	12.7	49.0
Civil engineers	218	30.0	5.9	13.0	3,426	35.0	92.8	8.0
Stock and bond sales agents	169	31.0	1.1	41.0	14,941	11.0	86.8	17.0
Real estate agents and brokers	162	32.0	1.8	38.0	5,141	31.0	57.0	39.0
Urban and regional planners	144	33.0	6.3	12.0	2,004	39.0	87.4	16.0
Health technicians/technologists, nec	143	34.0	1.8	37.0	2,770	38.0	34.8	47.0
Industrial engineers	139	35.0	1.5	40.0	8,695	23.0	94.0	6.0
Chemical technicians	131	36.0	6.5	10.0	1,646	41.0	81.8	21.0
Editors and reporters	105	37.0	3.3	25.0	1,612	42.0	50.7	43.0
Farm management advisers (except Extension personnel)	104	38.0	8.3	2.0	833	46.0	66.6	30.0
Adult educators	[illegible]	39.5	3.6	22.0	930	44.0	55.4	41.0
Statisticians	[illegible]	39.5	7.2	5.0	504	49.0	60.6	36.0
Credit and collection managers	18	41.0	1.9	30.0	558	48.0	[illegible]	38.0
Agricultural scientists	0	47.0	0.0	47.0	19,376	7.0	95.0	5.0

See footnotes at end of table.

Table 20.—Male workers with baccalaureate or higher degrees in food and agricultural specializations ranked by occupational employment and by minority status[1]—Continued

OES-census-occupation[2]	Male workers with baccalaureate or higher degrees in food and agricultural specializations							
	Minority[3]				Nonminority[4]			
	Number employed	Rank by number employed	Percent employment[5]	Rank by percent employment	Number employed	Rank by number employed	Percent employment[6]	Rank by percent employment
Assessors, controllers, treasurers (local public administration)	0	47.0	0.0	47.0	460	50.0	64.1	33.0
Buyers and shippers (farm products)	0	47.0	0.0	47.0	15,407	10.0	96.3	3.0
Dietitians	0	47.0	0.0	47.0	4,075	32.0	8.9	50.0
Farm managers	0	47.0	0.0	47.0	19,200	8.0	96.0	4.0
Marine scientists	0	47.0	0.0	47.0	600	47.0	100.0	1.0
Real estate appraisers	0	47.0	0.0	47.0	1,377	43.0	90.6	14.0
Surveyors	0	47.0	0.0	47.0	1,902	40.0	98.6	2.0
Veterinarians	0	47.0	0.0	47.0	22,051	6.0	89.3	15.0
College and university faculty	NA	NA	NA	NA	NA	NA	NA	NA
Secondary/post-secondary vocational agriculture teachers	NA	NA	NA	NA	NA	NA	NA	NA

NA = not available

[1] Based on OES national census-based data and unpublished Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Includes Whites and White-Hispanics.

[5] Percent of total workers in a given occupation who are minority males.

[6] Percent of total workers in a given occupation who are nonminority males.

[7] nec = not elsewhere classified.

[8] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 514 males for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 7 for detailed data.

[9] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

Table 21.—Occupational employment of minority and nonminority workers and estimated demand for graduates with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations		1976-85 estimated average annual openings (all races)[5]
	Minority[3]	Nonminority[4]	
Adult educators	179	1,501	118
Agricultural and biological technicians (except health)	1,621	22,571	850
Agricultural scientists	0	20,396	1,304
Architects (landscape)[6]	624	12,376	944
Assessors, controllers, treasurers (local public administration)	0	718	46
Bank officers and financial managers	437	9,095	746
Biological scientists	1,228	9,176	663
Buyers (wholesale and retail trade)	690	12,846	1,702
Buyers and shippers (farm products)	0	15,999	812
Chemical technicians	209	1,803	17
Chemists	914	11,612	1,058
Civil engineers	240	3,452	186
College and university faculty[7]	1,254	24,643	1,082
Cooperative Extension Services personnel[8]	1,525	16,246	1,255
Credit and collection managers	54	900	32
Dietitians	9,158	36,632	2,763
Economists	408	4,282	246
Editors and reporters	191	2,983	226
Engineers, nec[9] (agricultural engineers)	828	11,172	633
Estimators and investigators, nec	1,291	13,549	1,111
Expediters and product controllers	947	9,341	613
Farm management advisers (except Extension personnel)	104	1,146	8
Farm managers	0	20,000	2,391
Farmers (owners and tenants)	6,919	216,274	3,728
Food service workers, nec (except private)	4,071	15,135	821
Foresters and conservationists	1,328	47,859	2,082
Gardeners and groundskeepers (except farm)	2,651	12,325	1,067
Health aides (except nursing)	1,399	5,265	738
Health technicians/technologists, nec	923	7,036	365
Industrial engineers	185	9,065	518
Inspectors (public administration--except construction)	2,006	20,787	1,533
Inspectors, scalers, and graders (log and lumber)	975	17,419	763
Insurance adjusters, examiners, and investigators	1,820	15,853	893
Insurance agents, brokers, and underwriters	429	9,118	515

See footnotes at end of table.

Table 21. — Occupational employment of minority and nonminority workers and estimated demand for graduates with baccalaureate or higher degrees in food and agricultural specializations[1] — Continued

OES-census-occupation[2]	Workers with baccalaureate or higher degrees in food and agricultural specializations		1976-85 estimated average annual openings (all races)[5]
	Minority[3]	Nonminority[4]	
Managers and administrators, nec	6,075	162,678	5,960
Marine scientists	0	600	26
Mechanical engineers	855	11,363	522
Officials and administrators, nec (public administrators)	1,371	13,372	988
Purchasing agents and buyers, nec	322	7,329	304
Real estate agents and brokers	243	8,775	872
Real estate appraisers	47	1,473	102
Recreation workers	1,427	8,022	538
Restaurant, cafeteria, and bar managers	436	5,080	286
Sales managers and department heads (retail)	875	21,003	1,300
Sales managers (except retail)	627	26,642	671
Sales workers and sales clerks, nec	2,190	47,566	1,813
Secondary/post-secondary vocational agriculture teachers[10]	1,073	11,727	1,600
Statisticians	89	742	32
Stock and bond sales agents	189	17,024	945
Surveyors	0	1,929	85
Urban and regional planners	144	2,148	200
Veterinarians	0	24,693	1,448

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[1] Based on OES national census-based data and Current Population Survey, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Includes Whites and White-Hispanics.

[5] Projected annual job openings through 1985 for graduates in food and agricultural specializations generated using the Occupational Employment Statistics Program, DOL; includes openings due to employee deaths, retirements, disabilities, and temporary withdrawals, as well as industry growth.

[6] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[7] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 5 for detailed data.

[8] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 829 employees for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 7 for detailed data.

[9] nec = not elsewhere classified.

[10] 1979 minority and nonminority employment data provided by the Office of Vocational and Adult Education, DOED; average annual openings based on data provided by the Professional Personnel Recruitment Committee, Agricultural Education Division, American Vocational Association.

Table 22.—Trends related to occupational employment of minorities with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Minorities with baccalaureate or higher degrees in food and agricultural specializations[3]				
	Number employed 1976	Percent of occupational employment[4]		Change in percent from 1972-1978	Percent relative change from 1972-1978[5]
		1972	1978		
Adult educators	179	10.1	11.1	1.0	9.9
Agricultural and biological technicians (except health)	1,621	7.3	8.5	1.2	16.4
Agricultural scientists	0	15.4	5.3	-10.1	-65.6
Architects (landscape)[6]	624	4.5	5.8	1.3	28.9
Assessors, controllers, treasurers (local public administration)	0	0.0	2.8	2.8	NC
Bank officers and financial managers	437	2.6	4.4	1.8	69.2
Biological scientists	1,228	8.3	12.1	3.8	45.8
Buyers (wholesale and retail trade)	690	4.3	5.3	1.0	23.3
Buyers and shippers (farm products)	0	0.0	0.0	0.0	0.0
Chemical technicians	209	6.5	6.6	0.1	1.5
Chemists	914	8.4	11.9	3.5	41.7
Civil engineers	240	5.2	8.1	2.9	55.8
College and university faculty[7]	1,254	NA	NA	NA	NA
Cooperative Extension Services personnel[8]	1,525	NA	NA	NA	NA
Credit and collection managers	54	1.4	2.0	0.6	42.9
Dietitians	9,158	18.2	22.0	3.8	20.9
Economists	408	5.9	8.5	2.6	44.1
Editors and reporters	191	4.3	4.9	0.6	14.0
Engineers, nec[9] (agricultural engineers)	828	2.4	5.2	2.8	116.7
Estimators and investigators, nec	1,291	4.9	10.6	5.7	116.3
Expediters and product controllers	947	6.7	8.0	1.3	19.4
Farm management advisors (except Extension personnel)	104	7.7	18.2	10.5	136.4
Farm managers	0	3.3	2.9	-0.4	-12.4
Farmers (owners and tenants)	6,919	3.3	3.5	0.2	6.1
Food service workers, nec (except private)	4,071	22.5	20.6	-1.9	-8.4
Foresters and conservationists	1,328	2.1	3.4	1.3	61.9
Gardeners and groundskeepers (except farm)	2,651	20.0	17.1	-2.9	-14.5
Health aides (except nursing)	1,399	22.3	19.3	-3.0	-13.5
Health technicians/technologists, nec	923	17.9	15.0	-2.9	-16.2
Industrial engineers	185	2.4	5.3	2.9	120.8
Inspectors (public administration--except construction)	2,006	7.2	7.1	-0.1	-1.4
Inspectors, scalers, and graders (log and lumber)	975	17.4	20.0	2.6	14.9
Insurance adjusters, examiners, and investigators	1,820	6.5	11.2	4.7	72.3
Insurance agents, brokers, and underwriters	429	3.4	6.8	3.4	100.0
Managers and administrators, nec	6,[illegible]75	3.2	4.2	1.0	31.3
Marine scientists	0	0.0	0.0	0.0	0.0
Mechanical engineers	855	3.1	5.1	2.0	64.5
Officials and administrators, nec (public administrators)	1,371	9.1	9.0	-0.1	-1.1

See footnotes at end of table.

Table 22. — Trends related to occupational employment of minorities with baccalaureate or higher degrees in food and agricultural specializations[1] — Continued

OES-census-occupation[2]	Minorities with baccalaureate or higher degrees in food and agricultural specializations[3]				
	Number employed 1976	Percent of occupational employment[4]		Change in percent from 1972-1978	Percent relative change from 1972-1978[5]
		1972	1978		
Purchasing agents and buyers, nec	322	3.3	4.3	1.0	30.3
Real estate agents and brokers	243	2.6	2.7	0.1	3.8
Real estate appraisers	47	0.0	3.2	3.2	NC
Recreation workers	1,427	16.3	20.7	4.4	27.0
Restaurant, cafeteria, and bar managers	436	8.9	8.7	-0.2	-2.2
Sales managers and department heads (retail)	875	2.0	5.0	3.0	150.0
Sales managers (except retail)	627	0.7	1.8	1.1	157.1
Sales workers and sales clerks, nec	2,[illegible]90	3.7	5.2	1.5	40.5
Secondary/post-secondary vocational agriculture teachers[10]	1,073	NA	NA	NA	NA
Statisticians	89	14.3	8.7	-5.6	-39.2
Stock and bond sales agents	189	2.0	3.7	1.7	85.0
Surveyors	0	2.8	2.4	-0.4	-14.3
Urban and regional planners	144	8.3	5.9	-2.4	-28.9
Veterinarians	0	0.0	3.8	3.8	NC

NA = not available
NC = not computable

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[1] Based on OES national census-based data and Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Percent of workers in each selected OES-census-based occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations who are minority.

[5] Percent relative change equals 1978 percent of occupational employment minus 1972 percent of occupational employment, divided by 1972 percent of occupational employment, and multiplied by 100.

[6] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[7] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. Nonminority status refers only to Non-Spanish Caucasians.

[8] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 829 employees for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians.

[9] nec = not elsewhere classified.

[10] 1979 data provided by the Office of Vocational and Adult Education, DOED.

Table 23.—Trends related to occupational employment of minority females with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Minority females with baccalaureate or higher degrees in food and agricultural specializations[3]				
	Number employed 1976	Percent of occupational employment[4]		Change in percent from 1972-1978	Percent relative change from 1972-1978[5]
		1972	1978		
Adult educators	119	5.8	7.4	1.6	27.6
Agricultural and biological technicians (except health)	532	2.4	2.1	-0.3	-12.5
Agricultural scientists	0	0.0	0.0	0.0	0.0
Architects (landscape)[6]	0	0.0	0.0	0.0	0.0
Assessors, controllers, treasurers (local public administration)	0	0.0	0.0	0.0	0.0
Bank officers and financial managers	142	0.9	1.6	0.7	77.8
Biological scientists	406	2.8	5.2	2.4	85.7
Buyers (wholesale and retail trade)	257	1.2	2.4	1.2	100.0
Buyers and shippers (farm products)	0	0.0	0.0	0.0	0.0
Chemical technicians	78	1.3	2.6	1.3	100.0
Chemists	200	3.4	3.4	0.0	0.0
Civil engineers	22	0.0	0.0	0.0	0.0
College and university faculty	NA	NA	NA	NA	NA
Cooperative Extension Services personnel[7]	784	NA	NA	NA	NA
Credit and collection managers	36	0.0	0.0	0.0	0.0
Dietitians	9,158	15.2	20.0	4.8	31.6
Economists	89	1.5	0.8	-0.7	-46.7
Editors and reporters	86	2.5	2.7	0.2	8.0
Engineers, nec[8] (agricultural engineers)	72	0.0	0.0	0.0	0.0
Estimators and investigators, nec	965	3.2	7.3	4.1	128.1
Expediters and product controllers	350	1.5	4.5	3.0	200.0
Farm management advisers (except Extension personnel)	0	0.0	9.1	9.1	NC
Farm managers	0	0.0	0.0	0.0	0.0
Farmers (owners and tenants)	223	0.2	0.3	0.1	50.0
Food service workers, nec (except private)	3,207	16.9	14.8	-2.1	-12.4
Foresters and conservationists	0	0.0	0.0	0.0	0.0
Gardeners and groundskeepers (except farm)	45	0.2	0.7	0.5	250.0
Health aides (except nursing)	1,166	16.2	16.3	0.1	0.6
Health technicians/technologists, nec	780	9.0	10.5	1.5	16.7
Industrial engineers	46	0.6	1.9	1.3	216.7
Inspectors (public administration--except construction)	205	3.1	2.0	-1.1	-35.5
Inspectors, scalers, and graders (log and lumber)	0	0.0	10.0	10.0	NC
Insurance adjusters, examiners, and investigators	1,361	4.6	7.7	3.1	67.4
Insurance agents, brokers, and underwriters	95	0.9	2.4	1.5	166.7
Managers and administrators, nec	1,350	0.6	0.8	0.2	33.3
Marine scientists	0	0.0	0.0	0.0	0.0
Mechanical engineers	0	0.0	0.0	0.0	0.0
Officials and administrators, nec (public administrators)	398	2.9	3.3	0.4	13.8
Purchasing agents and buyers, nec	77	1.7	1.6	-0.1	-5.9
Real estate agents and brokers	81	0.6	0.9	0.3	50.0

See footnotes at end of table.

Table 23. — Trends related to occupational employment of minority females with baccalaureate or higher degrees in food and agricultural specializations[1] — Continued

OES-census-occupation[2]	Minority females with baccalaureate or higher degrees in food and agricultural specializations[3]				
	Number employed 1976	Percent of occupational employment[4]		Change in percent from 1972-1978	Percent relative change from 1972-1978[5]
		1972	1978		
Real estate appraisers	47	0.0	0.0	0.0	0.0
Recreation workers	794	7.6	11.6	4.0	52.6
Restaurant, cafeteria, and bar managers	177	3.6	3.1	0.5	-13.9
Sales managers and department heads (retail)	197	0.7	2.0	1.3	185.7
Sales managers (except retail)	191	0.0	0.3	0.3	NC
Sales workers and sales clerks, nec	1,095	2.2	2.8	0.6	27.3
Secondary/post-secondary vocational agriculture teachers	NA	NA	NA	NA	NA
Statisticians	29	4.8	4.3	-0.5	-10.4
Stock and bond sales agents	0	0.0	2.8	2.8	NC
Surveyors	0	0.0	0.0	0.0	0.0
Urban and regional planners	0	0.0	0.0	0.0	0.0
Veterinarians	0	0.0	0.0	0.0	0.0

NA = not available

NC = not computable

[1] Based on OES national census-based data and Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Percent of workers in each selected OES-census-based occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations who are minority female.

[5] Percent relative change equals 1978 percent of occupational employment minus 1972 percent of occupational employment, divided by 1972 percent of occupational employment, and multiplied by 100.

[6] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[7] Based on Science and Education, Cooperative Extension Services master personnel file, May, 1981; does not include 315 females for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians.

[8] nec = not elsewhere classified.

Table 24.—Trends related to occupational employment of minority males with baccalaureate or higher degrees in food and agricultural specializations[1]

OES-census-occupation[2]	Minority males with baccalaureate or higher degrees in food and agricultural specializations[3]				
	Number employed 1976	Percent of occupational employment[4]		Change in percent from 1972-1978	Percent relative change from 1972-1978[5]
		1972	1978		
Adult educators	60	4.3	3.7	-0.6	-14.0
Agricultural and biological technicians (except health)	1,089	4.9	6.4	1.5	30.6
Agricultural scientists	0	15.4	5.3	-10.1	-65.6
Architects (landscape)[6]	624	4.5	5.8	1.3	28.9
Assessors, controllers, treasurers (local public administration)	0	0.0	2.8	2.8	NC
Bank officers and financial managers	295	1.7	2.8	1.1	64.7
Biological scientists	822	5.5	6.9	1.4	25.5
Buyers (wholesale and retail trade)	433	3.1	2.9	-0.2	-6.5
Buyers and shippers (farm products)	0	0.0	0.0	0.0	0.0
Chemical technicians	131	5.2	4.0	-1.2	-23.1
Chemists	714	5.0	8.5	3.5	70.0
Civil engineers	218	5.2	8.1	2.9	55.8
College and university faculty	NA	NA	NA	NA	NA
Cooperative Extension Services personnel[7]	741	NA	NA	NA	NA
Credit and collection managers	18	1.4	2.0	0.6	42.9
Dietitians	0	3.0	2.0	-1.0	-33.3
Economists	319	4.4	7.7	3.3	75.0
Editors and reporters	105	1.8	2.2	0.4	22.2
Engineers, nec[8] (agricultural engineers)	756	2.4	5.2	2.8	116.7
Estimators and investigators, nec	326	1.7	3.3	1.6	94.1
Expediters and product controllers	597	5.2	3.5	1.7	-32.7
Farm management advisers (except Extension personnel)	104	7.7	9.1	1.4	18.2
Farm managers	0	3.3	2.9	-0.4	12.1
Farmers (owners and tenants)	6,696	3.1	3.2	0.1	3.2
Food service workers, nec (except private)	864	5.6	5.8	0.2	3.6
Foresters and conservationists	1,328	2.1	3.4	1.3	6.2
Gardeners and groundskeepers (except farm)	2,606	19.8	16.4	-3.4	-17.2
Health aides (except nursing)	233	6.1	3.0	-3.1	-50.8
Health technicians/technologists, nec	143	8.9	4.5	-4.4	-49.4
Industrial engineers	139	1.8	3.4	1.6	88.9
Inspectors (public administration--except construction)	1,801	4.1	5.1	1.0	24.4
Inspectors, scalers, and graders (log and lumber)	975	1	10.0	-7.4	-42.5
Insurance adjusters, examiners, and investigators	459	1.9	3.5	1.6	84.2
Insurance agents, brokers, and underwriters	334	2.5	4.4	1.9	76.0
Managers and administrators, nec	4,725	2.6	3.4	0.8	30.8
Marine scientists	0	0.0	0.0	0.0	0.0
Mechanical engineers	855	3.1	5.1	2.0	64.5
Officials and administrators, nec (public administrators)	973	6.2	5.7	-0.5	-8.1
Purchasing agents and buyers, nec	245	1.6	2.7	1.1	68.8
Real estate agents and brokers	162	2.0	1.8	-0.2	-10.0
Real estate appraisers	0	0.0	3.2	3.2	NC

See footnotes at end of table.

Table 24. —Trends related to occupational employment of minority males with baccalaureate or higher degrees in food and agricultural specializations[1] – Continued

OES-census-occupation[2]	Minority males with baccalaureate or higher degrees in food and agricultural specializations[3]				
	Number employed 1976	Percent of occupational employment[4]		Change in percent from 1972-1978	Percent relative change from 1972-1978[5]
		1972	1978		
Recreation workers	633	8.7	9.1	0.4	4.6
Restaurant, cafeteria, and bar managers	259	5.3	5.6	0.3	5.7
Sales managers and department heads (retail)	678	1.3	3.0	1.7	130.8
Sales managers (except retail)	436	0.7	1.5	0.8	114.3
Sales workers and sales clerks, nec	095	2.5	2.4	-0.1	-4.0
Secondary/post-secondary vocational agriculture teachers	NA	NA	NA	NA	NA
Statisticians	60	9.5	4.4	-5.1	-53.7
Stock and bond sales agents	189	2.0	0.9	-1.1	-55.0
Surveyors	0	2.8	2.4	-0.4	-14.3
Urban and regional planners	144	8.3	5.9	2.4	28.9
Veterinarians	0	0.0	3.8	3.8	NC

NA = not available

NC = not computable

[1] Based on OES national census-based data and Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

[3] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[4] Percent of workers in each selected OES-census-based occupation estimated as possessing baccalaureate or higher degrees in food and agricultural specializations who are minority male.

[5] Percent relative change equals 1978 percent of occupational employment minus 1972 percent of occupational employment, divided by 1972 percent of occupational employment, and multiplied by 100.

[6] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

[7] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 514 males for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians.

[8] nec = not elsewhere classified.

CHAPTER V

SEX, RACE, AND ETHNICITY SUMMARY STATISTICS

The purpose of this chapter is to summarize sex, race, and ethnicity statistics for students and graduates in the food and agricultural sciences and for workers in food and agricultural occupations. While no new data are introduced in the chapter, previously presented data are formated to provide an overview of participation in the food and agricultural sciences disciplines and occupations, classified by the demographic characteristics studied.

Tables 25-30, in this chapter, suggest that significant numbers of females are pursuing and earning degrees in the food and agricultural sciences. For example in 1978/79, 38 percent of the baccalaureate graduates, 33 percent of the master's, and 14 percent of the doctoral graduates were female. However, only about 3 percent of the total number of students enrolled in the food and agricultural sciences are minorities; 4 percent of all doctoral and master's students are minorities and 3 percent of all baccalaureate students are minorities. Yet, for fall 1978, approximately 16 percent of all students enrolled at four-year colleges and universities were minorities. Furthermore, total minority college enrollment in the United States increased 23 percent from 1974 to 1979. These data strongly suggest that other disciplines are competing much more successfully for minority students. Because of the current and projected shortages of agricultural scientists and professionals, greater attention should be focused on the recruitment of minority students into food and agricultural disciplines.

For employment trends from 1972 through 1978, both females and minorities have increased participation in food and agricultural occupations. Females, however, have outpaced minorities with regard to numerical and percent relative increments for the majority of occupations. Until more minority students elect to pursue degrees in the food and agricultural sciences, these trends are apt to continue.

Table 25.—Overview of students/graduates at the baccalaureate and higher degree levels in food and agricultural specializations

Category, by academic year and program level	Sex and minority status				
	Total[1]	Female	Male	Minority[2]	Non-minority[3]
Degrees conferred, 1976/77[4]					
Baccalaureate	32,629	11,260	19,672	NA	NA
Master's	6,563	1,766	3,949	NA	NA
Doctoral	1,367	169	1,165	NA	NA
Doctor of Veterinary Medicine	1,586	362	1,224	64	1,522
Total	41,264	13,557	26,010	NA	NA
Degrees conferred, 1978/79[4]					
Baccalaureate	34,958	13,427	19,780	NA	NA
Master's	7,129	2,334	3,947	NA	NA
Doctoral	1,527	220	1,274	NA	NA
Doctor of Veterinary Medicine	1,714	496	1,218	86	1,628
Total	45,328	16,477	26,219	NA	NA
Student enrollment, 1979/80					
Baccalaureate[5]	115,221	45,269	69,952	3,296	111,925
Master's[5]	16,954	5,907	11,047	739	16,215
Doctoral[5]	6,948	1,517	5,431	288	6,660
Doctor of Veterinary Medicine[6]	5,711	2,224	3,487	249	5,462
Total	144,834	54,917	89,917	4,572	140,262

NA = not available

[1] When total does not equal sum of female and male data, difference is due to unavailable sex data for degree specialization in agricultural education.

[2] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Hispanics.

[3] Includes Non-Hispanic Whites.

[4] Based on HEGIS data from the National Center for Education Statistics, DOED; includes nonresident aliens.

[5] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. Sample response rates to the Clemson University survey varied among Colleges of Agriculture and Natural Resources (.700), Schools of Forestry (.471), Schools of Veterinary Medicine (.500), and Colleges of Home Economics (.503). For purposes of comparison, all sample data from the Clemson University survey presented in Table 25 for forestry, veterinary medicine, and home economics have been adjusted to represent a 70 percent response rate.

[6] Fall 1980 data provided by the Association of American Veterinary Medical Colleges; population data adjusted to represent a 70 percent sample to facilitate comparison.

Table 26.—Overview of occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations classified by sex[1]

OES-census-occupation[2]	1976-85 average annual openings (both sexes, all races)[3]		Female employment				Male employment			
			1976		1972-1978		1976		1972-1978	
	Rank	Frequency	Rank	Frequency	Change in Percent	Percent relative change[4]	Rank	Frequency	Change in percent	Percent relative change[4]
Managers and administrators, nec[5]	1.0	5,960	2.0	24,469	4.5	37.2	2.0	144,284	-4.5	-5.1
Farmers (owners and tenants)	2.0	3,728	5.0	13,391	2.9	48.3	1.0	209,802	-2.9	-3.1
Dietitians	3.0	2,763	1.0	41,715	3.1	3.4	35.0	4,075	-3.1	-34.1
Farm managers	4.0	2,391	33.0	800	8.1	245.5	10.0	19,200	-8.1	-8.4
Foresters and conservationists	5.0	2,082	20.0	2,656	2.7	64.3	3.0	46,531	-2.7	-2.8
Sales workers and sales clerks, nec	6.0	1,813	3.0	22,590	2.2	5.0	4.0	27,166	-2.2	-3.9
Buyers (wholesale and retail trade)	7.0	1,702	15.0	4,304	7.1	21.6	24.0	9,232	-7.1	-10.6
Secondary/post-secondary vocational agriculture teachers[6]	8.0	1,600	35.0	676	NA	NA	20.0	12,122	NA	NA
Inspectors (public administration--except construction)	9.0	1,533	25.0	2,006	9.1	146.8	8.0	20,787	-9.1	-9.7
Veterinarians	10.0	1,448	21.0	2,642	6.7	77.0	6.0	22,051	-6.7	-7.3
Agricultural scientists	11.0	1,304	32.0	1,020	10.5	NC	9.0	19,376	-10.5	-10.5
Sales managers and department heads (retail)	12.0	1,300	8.0	7,745	9.9	36.1	16.0	14,133	-9.9	-13.6
Cooperative Extension Services personnel[7]	13.0	1,255	10.0	6,463	NA	NA	19.0	12,137	NA	NA
Estimators and investigators, nec	14.0	1,111	9.0	7,213	10.0	23.0	29.0	7,627	-10.0	-17.7
College and university faculty[8]	15.0	1,082	14.0	4,350	NA	NA	7.0	21,547	NA	NA
Gardeners and groundskeepers (except farm)	16.0	1,067	38.0	554	3.7	168.2	15.0	14,422	-3.7	-3.8
Chemists	17.0	1,058	30.0	1,428	4.3	42.6	23.0	11,090	-4.3	-4.8
Officials and administrators, nec (public administrators)	18.0	988	17.0	3,538	4.4	21.6	22.0	11,205	-4.4	-5.5
Stock and bond sales agents	19.0	945	24.0	2,083	8.4	84.8	13.0	15,130	-8.4	-9.3
Architects (landscape)[9]	20.0	944	39.5	416	2.8	93.3	17.0	12,584	-2.8	-2.9
Insurance adjusters, examiners, and investigators	21.0	893	7.0	9,066	17.2	50.1	26.0	8,607	-17.2	-26.2
Real estate agents and brokers	22.0	872	16.0	3,715	8.3	22.6	33.0	5,303	-8.3	-13.1
Agricultural and biological technicians (except health)	23.0	850	6.0	9,677	2.6	8.9	14.0	14,515	-2.6	-3.7
Food service workers, nec (except private)	24.0	821	4.0	14,769	0.9	1.2	34.0	4,437	-0.9	-3.4
Buyers and shippers (farm products)	25.0	812	37.0	592	0.0	0.0	12.0	15,407	0.0	0.0
Inspectors, scalers, and graders (log and lumber)	26.0	763	19.0	2,906	6.3	72.4	11.0	15,488	-6.3	-6.9

See footnotes at end of table.

Table 26. —Overview of occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations classified by sex[1] – Continued

OES-census-occupation[2]	1976-85 average annual openings (both sexes, all races)[3]		Female employment				Male employment			
			1976		1972-1978		1976		1972-1978	
	Rank	Frequency	Rank	Frequency	Change in Percent	Percent relative change[4]	Rank	Frequency	Change in percent	Percent relative change[4]
Bank officers and financial managers	27.0	746	23.0	2,353	11.4	60.0	31.0	7,179	-11.4	-14.1
Health aides (except nursing)	28.0	738	11.0	5,584	7.2	9.1	46.0	1,080	-7.2	-34.4
Sales managers (except retail)	29.0	671	31.0	1,254	4.1	141.4	5.0	26,015	-4.1	-4.2
Biological scientists	30.0	663	22.0	2,445	12.9	51.6	28.0	7,959	-12.9	-17.2
Engineers, nec (agricultural engineers)	31.0	633	46.0	156	2.3	NC	21.0	11,844	-2.3	-2.3
Expediters and product controllers	32.0	613	18.0	3,086	9.0	39.0	30.0	7,202	-9.0	-11.7
Recreation workers	33.0	538	12.0	5,396	12.4	27.8	36.0	4,053	-12.4	-22.4
Mechanical engineers	34.0	522	49.0	61	0.9	NC	18.0	12,157	-0.9	-0.9
Industrial engineers	35.0	518	39.5	416	6.3	262.5	25.0	8,834	-6.3	-6.5
Insurance agents, brokers, and underwriters	36.0	515	27.0	1,565	8.7	75.0	27.0	7,982	-8.7	-9.8
Health technicians/technologists, nec	37.0	365	13.0	5,046	2.0	3.4	40.0	2,913	-2.0	-4.8
Purchasing agents and buyers, nec	38.0	304	28.0	1,515	11.0	82.7	32.0	6,136	-11.0	-12.7
Restaurant, cafeteria, and bar managers	39.0	286	26.0	1,931	1.4	4.3	39.0	3,595	-1.4	-2.1
Economists	40.0	246	36.0	675	11.1	94.1	37.0	4,015	-11.1	-12.6
Editors and reporters	41.0	226	29.0	1,457	1.3	3.2	44.0	1,717	-1.3	-2.2
Urban and regional planners	42.0	200	47.0	144	3.5	42.2	41.0	2,148	-3.5	-3.8
Civil engineers	43.0	186	50.0	48	1.3	216.7	38.0	3,644	-1.3	-1.3
Adult educators	44.0	118	34.0	690	11.7	31.0	47.0	990	-11.7	-18.8
Real estate appraisers	45.0	102	48.0	143	8.3	180.4	45.0	1,377	-8.3	-8.7
Surveyors	46.0	85	51.0	27	2.4	NC	42.0	1,902	-2.4	-2.4
Assessors, controllers, treasurers (local public administration)	47.0	46	44.0	258	15.5	44.9	52.0	460	-15.5	-23.7
Statisticians	48.5	32	43.0	267	9.7	25.5	51.0	564	-9.7	-15.7
Credit and collection managers	48.5	32	41.0	378	12.8	53.6	50.0	576	-12.8	-16.8
Marine scientists	50.0	26	52.0	0	20.0	NC	49.0	600	-20.0	-20.0
Chemical technicians	51.0	17	45.0	235	8.1	62.3	43.0	1,777	-8.1	-9.3
Farm management advisers (except Extension personnel)	52.0	8	42.0	313	21.0	136.4	48.0	937	-21.0	-24.8

NA = not available

NC = not computable

[1] Based on OES national census-based data and Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

(Footnotes Continued)

Table 26. — Overview of occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations classified by sex[1] — Continued

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(Footnotes Continued)

[3] Projected annual job openings through 1985 for graduates in food and agricultural specializations generated using the Occupational Employment Statistics Program, DOL; includes openings due to employee deaths, retirements, disabilities, and temporary withdrawals, as well as industry growth.

[4] Percent relative change equals 1978 percent of occupational employment minus 1972 percent of occupational employment, divided by 1972 percent of occupational employment, and multiplied by 100.

[5] nec = not elsewhere classified.

[6] 1979 female and male employment data provided by the Office of Vocational and Adult Education, DOED; average annual openings based on data provided by the Professional Personnel Recruitment Committee, Agriculture Education Division, American Vocational Association.

[7] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981. See Appendix 6 for detailed data.

[8] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. See Appendix 5 for detailed data.

[9] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

Table 27. — Overview of occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations classified by minority status[1]

OES-census-occupation[2]	1976-85 average annual openings (both sexes, all races)[3]		Minority employment[4]				Nonminority employment[5]			
			1976		1972-1978		1976		1972-1978	
	Rank	Frequency	Rank	Frequency	Change in percent	Percent relative change[6]	Rank	Frequency	Change in percent	Percent relative change[6]
Managers and administrators, nec[7]	1.0	5,960	3.0	6,075	1.0	31.3	2.0	162,678	-1.0	-1.0
Farmers (owners and tenants)	2.0	3,728	2.0	6,919	0.2	6.1	1.0	216,274	-0.2	-0.2
Dietitians	3.0	2,763	1.0	9,158	3.8	20.9	5.0	36,632	-3.8	-4.6
Farm managers	4.0	2,391	49.0	0	-0.4	-12.4	13.0	20,000	0.4	0.4
Foresters and conservationists	5.0	2,082	14.0	1,328	1.3	61.9	3.0	47,859	-1.3	-1.3
Sales workers and sales clerks, nec	6.0	1,813	6.0	2,190	1.5	40.5	4.0	47,566	-1.5	-1.6
Buyers (wholesale and retail trade)	7.0	1,702	26.0	690	1.0	23.3	22.0	12,846	-1.0	-1.0
Secondary/post-secondary vocational agriculture teachers[8]	8.0	1,600	18.0	1,073	NA	NA	25.0	11,727	NA	NA
Inspectors (public administration--except construction)	9.0	1,533	7.0	2,006	-0.1	-1.4	11.0	20,787	0.1	0.1
Veterinarians	10.0	1,448	49.0	0	3.8	NC	7.0	24,693	-3.8	-3.8
Agricultural scientists	11.0	1,304	49.0	0	-10.1	-65.6	12.0	20,396	10.1	11.9
Sales managers and department heads (retail)	12.0	1,300	23.0	875	3.0	150.0	10.0	21,003	-3.0	-3.1
Cooperative Extension Services personnel[9]	13.0	1,255	10.0	1,525	NA	NA	16.0	16,246	NA	NA
Estimators and investigators, nec	14.0	1,111	15.0	1,291	5.7	116.3	20.0	13,549	-5.7	-6.0
College and university faculty[10]	15.0	1,082	16.0	1,254	NA	NA	8.0	24,643	NA	NA
Gardeners and groundskeepers (except farm)	16.0	1,067	5.0	2,651	-2.9	-14.5	24.0	12,325	2.9	3.6
Chemists	17.0	1,058	22.0	914	3.5	41.7	26.0	11,612	-3.5	-3.8
Officials and administrators, nec (public administrators)	18.0	988	13.0	1,371	-0.1	-1.1	21.0	13,372	0.1	0.1
Stock and bond sales agents	19.0	945	38.0	189	1.7	85.0	15.0	17,024	-1.7	-1.7
Architects (landscape)[11]	20.0	944	28.0	624	1.3	28.9	23.0	12,376	-1.3	-1.4
Insurance adjusters, examiners, and investigators	21.0	893	8.0	1,820	4.7	72.3	18.0	15,853	-4.7	-5.0
Real estate agents and brokers	22.0	872	34.0	243	0.1	3.8	34.0	8,775	-0.1	-0.1
Agricultural and biological technicians (except health)	23.0	850	9.0	1,621	1.2	16.4	9.0	22,571	-1.2	-1.3
Food service workers, nec (except private)	24.0	821	4.0	4,071	-1.9	-8.4	19.0	15,135	1.9	2.5
Buyers and shippers (farm products)	25.0	812	49.0	0	0.0	0.0	17.0	15,999	0.0	0.0

See footnotes at end of table.

Table 27. — Overview of occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations classified by minority status[1] — Continued

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(Footnotes Continued)

[3] Projected annual job openings through 1985 for graduates in food and agricultural specializations generated using the Occupational Employment Statistics Program, DOL; includes openings due to employee deaths, retirements, disabilities, and temporary withdrawals, as well as industry growth.

[4] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Black-Hispanics.

[5] Includes Whites and White-Hispanics.

[6] Percent relative change equals 1978 percent of occupational employment minus 1972 percent of occupational employment, divided by 1972 percent of occupational employment, and multiplied by 100.

[7] nec = not elsewhere classified.

[8] 1979 minority and nonminority employment data provided by the Office of Vocational and Adult Education, DOED; average annual openings based on data provided by the Professional Personnel Recruitment Committee, Agriculture Education Division, American Vocational Association.

[9] Based on Science and Education, Cooperative Extension Services master personnel file, May 1981; does not include 829 employees for whom race/ethnic status is unknown. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 7 for detailed data.

[10] Based on the "1979/80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Food and Agriculture;" funded by U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman. Nonminority status refers only to Non-Spanish Caucasians. See Appendix 5 for detailed data.

[11] Source: "Occupational Projections and Training Needs." Bulletin 2020. BLS, DOL, 1979.

Table 27. — Overview of occupational employment of workers with baccalaureate or higher degrees in food and agricultural specializations classified by minority status[1] — Continued

OES-census-occupation[2]	1976-85 average annual openings (both sexes, all races)[3]		Minority employment[4]				Nonminority employment[5]			
			1976		1972-1978		1976		1972-1978	
	Rank	Frequency	Rank	Frequency	Change in percent	Percent relative change[6]	Rank	Frequency	Change in percent	Percent relative change[6]
Inspectors, scalers, and graders (log and lumber)	26.0	763	19.0	975	2.6	14.9	14.0	17,419	-2.5	-3.1
Bank officers and financial managers	27.0	746	29.0	437	1.8	69.2	32.0	9,095	-1.8	-1.8
Health aides (except nursing)	28.0	738	12.0	1,399	-3.0	-13.5	38.0	5,265	3.0	3.9
Sales managers (except retail)	29.0	671	27.0	627	1.1	157.1	6.0	26,642	-1.1	-1.1
Biological scientists	30.0	663	17.0	1,228	3.8	45.8	30.0	9,176	-3.8	-4.1
Engineers, nec (agricultural engineers)	31.0	633	25.0	828	2.8	116.7	28.0	11,172	-2.8	-2.9
Expediters and product controllers	32.0	613	20.0	947	1.3	19.4	29.0	9,341	-1.3	-1.4
Recreation workers	33.0	538	11.0	1,427	4.4	27.0	35.0	8,022	-4.4	-5.3
Mechanical engineers	34.0	522	24.0	855	2.0	64.5	27.0	11,363	-2.0	-2.1
Industrial engineers	35.0	518	39.0	185	2.9	120.8	33.0	9,065	-2.9	-3.0
Insurance agents, brokers, and underwriters	36.0	515	31.0	429	3.4	100.0	31.0	9,118	-3.4	-3.5
Health technicians/technologists, nec	37.0	365	21.0	923	-2.9	-16.2	37.0	7,036	2.9	3.5
Purchasing agents and buyers, nec	38.0	304	33.0	322	1.0	30.3	36.0	7,329	-1.0	-1.0
Restaurant, cafeteria, and bar managers	39.0	286	30.0	436	-0.2	-2.2	39.0	5,080	0.2	0.2
Economists	40.0	246	32.0	408	2.6	44.1	40.0	4,282	-2.6	-2.8
Editors and reporters	41.0	226	37.0	191	0.6	14.0	42.0	2,983	-0.6	-0.6
Urban and regional planners	42.0	200	41.0	144	-2.4	-28.9	43.0	2,148	2.4	2.6
Civil engineers	43.0	186	35.0	240	2.9	55.8	41.0	3,452	-2.9	-3.1
Adult educators	44.0	118	40.0	179	1.0	9.9	46.0	1,501	-1.0	-1.1
Real estate appraisers	45.0	102	45.0	47	3.2	NC	47.0	1,473	-3.2	-3.2
Surveyors	46.0	85	49.0	0	-0.4	-14.3	44.0	1,929	0.4	0.4
Assessors, controllers, treasurers (local public administration)	47.0	46	49.0	0	2.8	NC	51.0	718	-2.8	-2.8
Statisticians	48.5	32	43.0	89	-5.6	-39.2	50.0	742	5.6	6.5
Credit and collection managers	48.5	32	44.0	54	0.6	42.9	49.0	900	-0.6	-0.6
Marine scientists	50.0	26	49.0	0	0.0	0.0	52.0	600	0.0	0.0
Chemical technicians	51.0	17	36.0	209	0.1	1.5	45.0	1,803	-0.1	-0.1
Farm management advisers (except Extension personnel	52.0	8	42.0	104	10.5	136.4	48.0	1,146	-10.5	-11.4

NA = not available

NC = not computable

[1] Based on OES national census-based data and Current Population Survey data, 1976.

[2] Excludes occupations not likely to require baccalaureate or higher degrees in food and agricultural specializations.

(Footnotes Continued)

CHAPTER VI

MILITARY PERSONNEL AND FEDERAL PROFESSIONAL EMPLOYMENT IN FOOD AND AGRICULTURAL POSITIONS, CLASSIFIED BY SEX, RACE, AND ETHNICITY

A comprehensive analysis of food and agricultural professionals must also take into consideration military personnel and Federal employees. The purpose of this chapter is to present information concerning the number, sex, race, and ethnicity of individuals in such positions. Tables 28 and 29 denote military enlisted personnel and officers in food and agricultural related duty positions in the Armed Services. Table 30 provides similar information relative to Federal full-time workers.

Many of the occupations cited in tables 28-30 require a food/agricultural sciences degree. Such occupations include dietitian, veterinarian, agricultural engineer, soils analyst/scientist, plant physiologist, range conservationist, forester. Other occupations, however, are such that only a portion of the workers require food and/or agricultural expertise (such as environmental health specialist, biological scientist, economist, program analyst, or land law examiner). Therefore, while the totality of occupations identified in tables 28-30 provides insight into the broad spectrum of food and agricultural careers in the Federal government and the Armed Services, the magnitude of employment indicated in the tables is not necessarily representative of only those workers with higher education in the food and agricultural sciences.

For Armed Services personnel in duty positions which tend to require food and agricultural expertise, the following may be observed:

1. The greatest number of personnel are associated with positions related to veterinary sciences, food service, environmental sciences, and nutrition health care.

2. The greatest number of both minorities and females are in positions related to food service and health care.

For Federal employees in positions for which all workers tend to require food and agricultural expertise, the following may be noted:

1. The largest number of individuals are employed in such areas as food inspection, forestry, soil conservation, agricultural management, agricultural commodity grading, veterinary medicine, and park management.

2. Minorities are employed in the greatest numbers in the areas of park service/management, food assistance programs, plant protection and quarantine, soil conservation, forestry, agricultural management, dietetics, veterinary medical science, food inspection, and agricultural commodity grading.

3. Occupations for which the percent of minority employees is the highest are in such areas as food assistance programs, plant protection, irrigation systems, home economics, dietetics, and agricultural commodity grading.

4. The largest number of females is to be found in the areas of dietetics, park technology, food assistant programs, forestry, food inspection, and agricultural commodity grading.

5. Occupations for which the percent of female employment is the highest are in the areas of home economics, dietetics, park technology, food assistance programs, agricultural extension, range technology, food technology, and agricultural commodity grading.

Table 28.—Military enlisted personnel in selected Armed Services occupations using food and agricultural expertise classified by minority status and sex[1]

DOD occupation	Armed Service			Minority[2]		Nonminority[3]		Total
	Division	Code	Duty position	Male	Female	Male	Female	
495 Firefighting and damage control	Air Force	571X0	Fire protection specialist	1,334	50	4,098	218	5,700
		57100	Fire protection manager	2	0	23	0	25
	Army	51M	Fire fighter	77	5	315	6	403
	Marines	7051	Aircraft crash, fire and rescue man	247	0	512	0	759
		8811	Fireman	4	0	12	0	16
321 Food inspection and veterinary services	Air Force	908X0	Veterinary specialist	6	1	26	3	36
		90800	Veterinary manager	0	0	2	0	2
	Army	91T	Animal specialist	4	0	14	4	22
		91R	Veterinary specialist	13	2	38	5	58
800 Food service, general	Air Force	61200	Subsistence operations specialist	0	0	3	0	3
		612X0	Meat cutter	27	1	51	1	80
		61270	Meat processing supervisor	5	0	14	0	19
		622X0	Food service specialist	10	1	13	2	26
		622X1	Diet therapy specialist	0	1	3	3	7
		74200	Open mess general manager	4	0	13	0	17
		742X0	Open mess management specialist	100	7	400	35	542
	Army	00J	Club manager	230	2	446	10	688
		94B	Food service specialist	34	27	27	16	104
		94F	Hospital food service specialist	2	4	3	5	14
	Marines	3371	Cook	1	0	2	0	3
		4132	Club manager/treasurer	0	0	2	1	3
	Navy	3500-03	Mess management specialist	39	3	18	5	65
		3524-26	Closed mess management specialist	1	0	1	0	2
		3527-29	Wardroom/general mess supervisor	6	0	0	0	6
		3531-33	Gallery/pantry watch captain	1	0	0	0	1
		3536-37	Commissary meat cutter	1	0	0	0	1
494 Nuclear, biological, and chemical warfare	Army	54E	Chemical operations specialist	1,419	267	1,913	186	3,785
	Marines	5711	Nuclear, biological, and chemical defense specialist	0	0	1	0	1
491 Physical science laboratory	Army	51G	Soils analyst	1	0	8	0	9
322 Preventative medicine services	Air Force	907X0	Environmental health specialist	10	3	31	3	47
	Army	91S	Environmental health specialist	10	6	34	12	62
801 Stewards and enlisted aides	Marines	3372	Cook, specialist	22	0	13	0	35
		8915	Food service attendant	53	0	81	2	136
496 Other technical specialists and assistants	Army	OIH	Biological sciences assistant	28	14	96	38	176

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0 = No personnel in duty position at time of frequency tabulation. Armed Services may or may not be seeking personnel.

[1] Data supplied by the Defense Manpower Data Center (DMDC), Department of Defense (DOD). Frequency tabulations accessed from the DMDC files June 1979-October 1980.

[2] Includes Blacks, Hispanics, Asian/Pacific Islanders, and American Indians.

[3] Includes only Whites.

Table 29.—Military officers in selected Armed Services occupations using food and agricultural expertise classified by minority status and sex[1]

DOD occupation	Armed Service			Minority[2]		Nonminority[3]		Total
	Division	Code	Duty position	Male	Female	Male	Female	
6H Allied medical	Air Force	9211	Dietitian, trainee	4	1	1	0	6
		9216	Dietitian	0	8	8	57	73
		9011	Health services administrator, staff	15	0	162	1	178
		9016	Health services administrator, staff	12	0	260	0	272
		9021	Health care administrator, trainee	39	4	267	21	331
		9025	Health care administrator	13	0	242	3	258
	Army	65C	Hospital dietitian	1	13	31	110	155
		67A	Health care administrator	36	2	255	6	299
	Navy	0876	Dietitian, therapeutic	1	3	4	13	21
5C Biological scientists	Air Force	9136	Medical entomologist	0	0	11	0	11
		9156B	Biomedical laboratory officer, microbiology	0	1	11	0	12
		9621	Scientist, medical/biomedical, trainee	0	0	2	0	2
		9626	Scientist, medical/biomedical	0	0	2	0	2
	Army	68A	Microbiologist	3	0	46	1	50
		68D	Parasitologist	0	0	10	1	11
		68G	Entomologist	1	0	55	2	58
		68J	Physiologist	3	0	17	0	20
	Navy	0841	Microbiologist	2	0	38	4	44
		0848	Physiologist	1	0	8	0	9
		0860	Entomologist	1	0	15	0	16
4K Chemical	Army	74A	Chemical officer	57	4	399	40	500
4A Construction and utilities	Air Force	9111	Bio-environmental engineer, staff, trainee	0	0	17	0	17
		9116	Bio-environmental engineer, staff	1	0	44	0	45
		9121	Bio-environmental engineer, trainee	6	0	38	0	44
		9124	Bio-environmental engineer	5	0	117	0	122
8E Food service	Air Force	6241	Food service officer, trainee	8	1	9	6	24
		6244	Food service officer	1	2	10	9	22
	Army	43A	Club manager	16	1	138	11	166
		82A	Subsistence supply officer	3	2	22	9	36
		82C	Food service officer	3	1	21	5	30

See footnotes at end of table.

Table 29.—Military officers in selected Armed Services occupations using food and agricultural expertise classified by minority status and sex[1]—Continued

DOD occupation	Armed Service			Minority[2]		Nonminority[3]		Total
	Division	Code	Duty position	Male	Female	Male	Female	
	Army, warrant	021A	Club manager	10	0	44	0	54
		041A	Food service technician	35	0	135	0	170
	Marines	3302	Food services officer	1	1	3	4	9
	Navy	0814	Food service officer, medical facility	0	0	30	0	30
		1105	Mess treasurer	7	3	24	5	39
		1130	Food service officer	6	0	74	4	84
		1160	Food service administrator	0	0	5	0	5
5A Physical scientists	Air Force	2641	Chemist/biologist, trainee	4	0	41	3	48
		2645	Chemist/biologist	4	0	44	2	50
	Army	68C	Biochemist	6	0	58	3	67
	Navy	0840	Biochemist	0	0	18	1	19
		0843	Pharmacologist	0	0	1	0	1
6G Veterinarians	Air Force	9911	Staff veterinarian, trainee	0	0	3	0	3
		9916	Staff veterinarian	1	0	52	0	53
		9921	Veterinarian, trainee	0	0	10	2	12
		9925	Veterinarian	2	0	59	8	69
		9931	Veterinary scientist, trainee	0	0	6	1	7
		9936	Veterinary scientist	1	0	16	1	18
		9941	Veterinary clinical specialist, trainee	1	0	17	2	20
	Air Force	9946	Veterinary clinical specialist	0	0	38	0	38
		9951	Veterinary health service specialist, trainee	0	0	22	0	22
		9956	Veterinary health service specialist	2	0	34	0	36
	Army	64A	Veterinary services officer	14	1	134	3	152
		64B	Veterinary staff officer	1	0	51	0	52
		64C	Veterinary laboratory animal medicine officer	1	0	25	0	26
		64D	Veterinary pathologist	4	1	18	2	25
		64E	Veterinary microbiologist	0	0	7	0	7
		64F	Veterinary comparative medicine officer	1	0	8	0	9

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0 = No personnel in duty position at time of frequency tabulation. Armed Services may or may not be seeking personnel.

[1] Data supplied by the Defense Manpower Data Center (DMDC), Department of Defense (DOD). Frequency tabulations accessed from the DMDC files June 1979-October 1980.

[2] Includes Blacks, Hispanics, Asian/Pacific Islanders, and American Indians.

[3] Includes only Whites.

Table 30.—Federal full-time workers in occupations frequently employing graduates with baccalaureate or higher degrees in food and agricultural specializations classified by sex and minority status[1/2]

Occupation series		Full-time workers						
Code	Area	Total	Number female	Percent female	Number minority	Percent minority	Number female minority	Percent female minority
00020	Community planning	674	97	14.4	82	12.2	18	2.7
00023	Outdoor recreation planning	764	103	13.5	24	3.1	7	0.9
00025	Park management	2,214	149	6.7	123	5.6	17	0.8
00026	Park technician	2,354	719	30.5	225	9.6	78	3.3
00027	Crop insurance administration	225	3	1.3	6	2.7	0	0.0
00028	Environmental protection specialist	948	268	28.3	70	7.4	32	3.4
00029	Environmental protection assistant	179	136	76.0	44	24.6	34	19.0
00090	Guide	63	24	38.1	0	0.0	0	0.0
00110	Economist	5,609	881	15.7	377	6.7	111	2.0
00119	Economics assistant	108	78	72.2	39	36.1	36	33.3
00120	Food assistance program specialist	1,168	417	35.7	218	18.7	96	8.2
00135	Foreign agricultural affairs	131	4	3.1	5	3.8	0	0.0
00136	International cooperation	347	51	14.7	45	13.0	14	4.0
00150	Geography	182	35	19.2	8	4.4	5	2.7
00235	Employee development	2,787	990	35.5	593	21.3	301	10.8
00340	Program management	3,767	267	7.1	443	11.8	53	1.4
00345	Program analysis	11,816	3,783	32.0	1,383	11.7	736	6.2
00401	General biological science	3,997	695	17.4	345	8.6	100	2.5
00403	Microbiology	1,735	582	33.5	206	11.9	80	4.6
00404	Biological technician	5,527	1,795	32.5	1,188	21.5	382	6.9
00405	Pharmacology	362	71	19.6	48	13.3	14	3.9
00406	Agricultural extension	58	14	24.1	1	1.7	0	0.0
00408	Ecology	186	30	16.1	5	2.7	1	0.5
00410	Zoology	121	13	10.7	6	5.0	2	1.7
00413	Physiology	374	63	16.8	25	6.7	3	0.8
00414	Entomology	755	29	3.8	28	3.7	2	0.3
00421	Plant protection technician	263	46	17.5	50	19.0	14	5.3
00430	Botany	163	40	24.5	11	6.7	3	1.8
00434	Plant pathology	311	13	4.2	20	6.4	2	0.6
00435	Plant physiology	257	14	5.4	16	6.2	5	1.9
00436	Plant protection and quarantine	884	50	5.7	122	13.8	12	1.4
00437	Horticulture	86	10	11.6	5	5.8	0	0.0
00440	Genetics	236	17	7.2	12	5.1	1	0.4
00454	Range conservation	1,194	55	4.6	61	5.1	1	0.1

See footnotes at end of table.

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Table 30.—Federal full-time workers in occupations frequently employing graduates with baccalaureate or higher degrees in food and agricultural specializations classified by sex and minority status[1/2]—Continued

Occupation series		Full-time workers						
Code	Area	Total	Number female	Percent female	Number minority	Percent minority	Number female minority	Percent female minority
00455	Range technician	568	76	13.4	69	12.1	7	1.2
00457	Soil conservation	4,390	65	1.5	325	7.4	3	0.1
00458	Soil conservation technician	2,435	56	2.3	202	8.3	1	0.0
00459	Irrigation system technician	199	0	0.0	123	61.8	0	0.0
00460	Forestry	5,686	59	1.0	172	3.0	1	0.0
00462	Forestry technician	7,391	826	11.2	683	9.2	34	0.5
00470	Soil science	1,837	54	2.9	122	6.6	2	0.1
00471	Agronomy	339	3	0.9	11	3.2	0	0.0
00475	Agricultural management	2,753	104	3.8	244	8.9	5	0.2
00480	General fish and wildlife management	208	10	4.8	2	1.0	0	0.0
00482	Fishery biology	1,299	78	6.0	78	6.0	7	0.5
00485	Wildlife refuge management	474	21	4.4	13	2.7	3	0.6
00486	Wildlife biology	1,147	80	7.0	27	2.4	7	0.6
00487	Husbandry	106	4	3.8	6	5.7	1	0.9
00488	Fish hatchery management	24	0	0.0	0	0.0	0	0.0
00493	Home economics	81	78	96.3	15	18.5	14	17.3
00499	Biological student trainee	273	116	42.5	68	24.9	21	7.7
00630	Dietitian	1,172	1,137	97.0	241	20.6	232	19.8
00639	Educational therapist	112	51	45.5	26	23.2	10	8.9
00646	Pathology technician	599	386	64.6	188	31.4	102	17.0
00688	Sanitarian	43	5	11.6	20	46.5	2	4.7
00698	Environmental health technician	142	13	9.2	77	54.2	6	4.2
00701	Veterinary medical science	2,201	71	3.2	259	11.8	17	0.8
00704	Animal health technician	763	37	4.8	106	13.9	5	0.7
00799	Veterinary student trainee	9	4	44.4	2	22.2	1	11.1
00804	Fire prevention engineering	110	0	0.0	5	4.5	0	0.0
00807	Landscape architecture	647	44	6.8	24	3.7	4	0.6
00809	Construction control	4,024	38	0.9	378	9.4	5	0.1
00810	Civil engineering	15,456	226	1.5	1,261	8.5	35	0.2
00817	Surveying technician	2,258	155	6.9	351	15.5	6	0.3
00890	Agricultural engineering	437	3	0.7	20	4.6	0	0.0
00920	Estate tax examining	27	1	3.7	2	7.4	1	3.7
00950	Paralegal specialist	1,579	866	54.8	334	21.2	241	15.3
00965	Land law examining	223	161	72.2	44	19.7	37	16.6

See footnotes at end of table.

Table 30.—Federal full-time workers in occupations frequently employing graduates with baccalaureate or higher degrees in food and agricultural specializations classifed by sex and minority status[1/2]—Continued

Occupation series		Full-time workers						
Code	Area	Total	Number female	Percent female	Number minority	Percent minority	Number female minority	Percent female minority
01016	Museum specialist and technician	447	181	40.5	82	18.3	29	6.5
01081	Public information	2,910	976	33.5	207	7.1	91	3.1
01082	Writing and editing	2,173	1,223	56.3	235	10.8	159	7.3
01083	Technical writing and editing	1,711	575	33.6	146	8.5	72	4.2
01130	Public utilities specialist	476	111	23.3	34	7.1	13	2.7
01140	Trade specialist	444	85	19.1	49	11.0	22	5.0
01145	Agricultural program specialist	604	26	4.3	38	6.3	2	0.3
01146	Agricultural marketing	605	70	11.6	40	6.6	13	2.1
01147	Agricultural market reporting	197	15	7.6	5	2.5	1	0.5
01165	Loan specialist	4,574	1,177	25.7	743	16.2	298	6.5
01170	Realty	3,414	757	22.2	510	14.9	199	5.8
01171	Appraising and assessing	1,924	171	8.9	201	10.4	36	1.9
01315	Hydrology	1,988	65	3.3	66	3.3	4	0.2
01316	Hydrologic technician	1,291	165	12.8	119	9.2	23	1.8
01373	Land surveying	368	6	1.6	19	5.2	0	0.0
01380	Forest products technology	120	2	1.7	4	3.3	0	0.0
01382	Food technology	190	34	17.9	21	11.1	4	2.1
01384	Textile technology	93	17	18.3	4	4.3	0	0.0
01412	Technical information services	1,142	590	51.7	182	15.9	110	9.6
01510	Actuary	126	21	16.7	10	7.9	2	1.6
01530	Statistician	2,850	777	27.3	439	15.4	230	8.1
01659	Fishery methods and equipment	10	0	0.0	1	10.0	0	0.0
01701	General education and training	705	231	32.8	127	18.0	47	6.7
01710	Education and vocational training	14,712	7,358	50.0	2,632	17.9	1,335	9.1
01712	Training instruction	6,300	811	12.9	926	14.7	262	4.2
01812	Game law enforcement	300	12	4.0	16	5.3	1	0.3
01850	Agricultural commodity warehouse examining	134	1	0.7	1	0.7	0	0.0
01854	Alcohol, tobacco, and firearms inspection	920	218	23.7	80	8.7	43	4.7
01862	Consumer safety inspection	142	41	28.9	46	32.4	14	9.9
01863	Food inspection	7,274	742	10.2	934	12.8	175	2.4
01864	Public health quarantine inspection	31	1	3.2	4	12.9	0	0.0
01910	Quality assurance	12,496	569	4.6	1,219	9.8	116	0.9

See footnotes at end of table.

Table 30.—Federal full-time workers in occupations frequently employing graduates with baccalaureate or higher degrees in food and agricultural specializations classified by sex and minority status[1/2]—Continued

Occupation series		Full-time workers						
Code	Area	Total	Number female	Percent female	Number minority	Percent minority	Number female minority	Percent female minority
01960	Quality inspection	2,794	288	10.3	421	15.1	64	2.3
01980	Agricultural commodity grading	3,188	406	12.7	306	9.6	42	1.3
01981	Agricultural commodity aid	454	76	16.7	131	28.9	24	5.3
02032	Packaging	464	51	11.0	64	13.8	10	2.2
02111	Transportation rate and tariff examining	142	13	9.2	13	9.2	6	4.2
02131	Freight rate	1,085	536	49.4	262	24.1	151	13.9

[1] Source: Minority Group Study as of November 30, 1979, U.S. Office of Personnel Management.

[2] Minority denotes Black, Native American, Hispanic, or Oriental American.

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APPENDIX 1

Panel of consultants representing the Resident Instruction Section of the Division of Agriculture, National Association of State Universities and Land-Grant Colleges

Panel Member	University
Stephen Chapman, Ph.D. Associate Dean and Director of Instruction College of Agricultural Sciences	Clemson University Clemson, South Carolina
Ed Glazener, Ph.D. (Chairperson) Associate Dean and Director of Academic Affairs School of Agriculture and Life Sciences	North Carolina State University Raleigh, North Carolina
Allan Goecker, Ph.D.[1] Assistant Dean School of Agriculture	Purdue University West Lafayette, Indiana
Winston E. Pullen, Ph.D. Associate Dean for Instruction College of Life Sciences and Agriculture	University of Maine Orono, Maine

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[1] Detailed to the U.S. Department of Agriculture as the Director for the Office of Higher Education via the Intergovernmental Personnel Act, November 1981 through November 1982.

APPENDIX 2

Crosswalk for transposing Clemson University data to HEGIS format

HEGIS degree specialization	Clemson University degree specialization
Agriculture, general	Agriculture, general
Agricultural business	Agricultural business
	Agricultural business and management
Agricultural economics	Agricultural economics
Agricultural education	Agricultural education
	Agricultural extension
Agricultural engineering	Agricultural engineering
	Agricultural mechanization
Agriculture and farm management	Farm and ranch management
Agronomy	Agronomy
	Plant breeding and genetics (70%)
	Plant science (33%)
	Turf management
Animal science	Animal science
	Animal breeding
	Animal health
	Animal nutrition
	Animal physiology
	Livestock
Dairy science	Dairy science
Entomology	Plant protection (50%)
Fish, game, and wildlife management	Fisheries
	Wildlife management
Food science and technology	Food science
	Dairy industry, food science
	Food and food science
	Food distribution
	Food engineering
	Food packaging
	Food technology
Foods and nutrition	Food and nutrition
	Dietetics
	Human nutrition
	Human nutrition services
	Nutrition research
Forestry	Forestry
	Forest engineering
	Forest management
	Forest products utilization
	Silviculture
	Timber management
	Urban forestry

APPENDIX 2 — Continued

Crosswalk for transposing Clemson University data to HEGIS format

HEGIS degree specialization	Clemson University degree specialization
Horticulture, fruit and vegetable	Horticulture, fruit and vegetable Plant breeding and genetics (30%) Plant science (67%)
Horticulture, ornamental	Horticulture, ornamental
Institution and cafeteria management	Food service management Hotel, motel, tourism, hospitality management Institutional, hotel, restaurant management Institution management and administration
Landscape architecture	Landscape architecture
Marine biology	Marine biology
Natural resources management	Natural resources Atmospheric science Water resources
Parks and recreation management	Parks and recreation management
Plant pathology	Plant pathology Plant protection (50%)
Plant physiology	Plant physiology
Poultry science	Poultry science
Range management	Range management
Soil science	Soil science Soil chemistry Soil conservation Soil management and fertility Soil microbiology Soil physics
Other	Agricultural communications/ journalism
Veterinary medicine (D.V.M.)	Veterinary medicine (D.V.M.)

APPENDIX 3 — Continued

OES census-based occupations used in project and corresponding 1970 census of population codes

Occupation	1970 census of population code
Real estate agents and brokers	270
Real estate appraisers	363
Recreation workers	101
Restaurant, cafeteria, and bar managers	230
Sales managers and department heads (retail)	231
Sales managers (except retail)	233
Sales workers and sales clerks, nec	281-285
Secondary/post-secondary vocational agriculture teachers	NA[4]
Statisticians	036
Stock and bond sales agents	271
Surveyors	161
Urban and regional planners	095
Veterinarians	072

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[1] Used data provided by S&E/USDA funded study by Clemson University.
[2] Used USDA data rather than OES census-based data.
[3] nec = not elsewhere classified.
[4] Used data provided by American Vocational Association.

APPENDIX 3

OES census-based occupations used in project and corresponding 1970 census of population codes

Occupation	1970 census of population code
Adult educators	141
Agricultural and biological technicians (except health)	150
Agricultural scientists	042
Architects (landscape)	002
Assessors, controllers, treasurers (local public administration)	201
Bank officers and financial managers	202
Biological scientists	044
Buyers (wholesale and retail trade)	205
Buyers and shippers (farm products)	203
Chemical technicians	151
Chemists	045
Civil engineers	011
College and university faculty	NA[1]
Cooperative Extension Services personnel	NA[2]
Credit and collection managers	210
Dietitians	074
Economists	091
Editors and reporters	184
Engineers, nec[3] (agricultural engineers)	023
Estimators and investigators, nec	321
Expediters and product controllers	323
Farm management advisers (except Extension personnel)	024
Farm managers	802
Farmers (owners and tenants)	801
Food service workers, nec (except private)	916
Foresters and conservationists	025
Gardeners and groundkeepers (except farm)	755
Health aides (except nursing)	922
Health technicians/technologists, nec	085
Industrial engineers	013
Inspectors (public administration except construction)	215
Inspectors, scalers, and graders (log and lumber)	450
Insurance adjusters, examiners, and investigators	326
Insurance agents, brokers, and underwriters	265
Managers and administrators, nec	245
Marine scientists	052
Mechanical engineers	014
Officials and administrators, nec (public administrators)	222
Purchasing agents and buyers, nec	225

See footnotes at end of appendix.

APPENDIX 2 — Continued

Crosswalk for transposing Clemson University data to HEGIS format

HEGIS degree specialization	Clemson University degree specialization
Veterinary medicine specialties (post-D.V.M.)	Anatomy
	Anesthesiology
	Clinical nutrition
	Internal medicine
	Laboratory animal medicine
	Microbiology
	Opthalmology
	Pathology
	Pharmacology
	Physiology
	Preventive medicine
	Radiology
	Reproductive biology
	Surgery
	Toxicology
	Other

APPENDIX 4

OES census-based industries used in project and corresponding OES census matrix codes

OES census matrix code	Industry
100110	Agricultural production
100130	Agricultural services (except horticulture)
100170	Horticultural services
100800	Forestry
100900	Fisheries
201000	Metal mining
101100	Coal mining
201400	Nonmetallic mining and quarry
301500	General building contractors
301600	General contractors (except building)
301700	Special trade contractors
412410	Logging
412420	Sawmill planing mill, millwork
412440	Miscellaneous wood products
412500	Furniture and fixtures
413240	Cement, concrete, plaster
413280	Miscellaneous, nonmetallic stone
413510	Engines and turbines
413520	Farm machinery, equipment
413530	Construction machines
413560	Office, accounting machines
413590	Machinery, nec[1]
413630	Household appliances
413650	Radio, television, communications equipment
413690	Electrical machinery, nec
413710	Motor vehicle equipment
413720	Aircraft and parts
413730	Ship, boat building, repair
413790	Cycles, miscellaneous transportation equipment
413810	Scientific instruments
413830	Optical, health service supplies
422010	Meat products
422020	Dairy products
422030	Canning and preserving
422040	Grain mill products
422050	Bakery products
422070	Confectionery products
422080	Beverage industries
422090	Miscellaneous food preparation
422100	Tobacco manufacturing
422280	Yarn, fabric mills
422290	Miscellaneous textile mill products
422310	Apparel and accessories
422610	Pulp, paper, paperboard mills
422650	Paperboard containers, boxes
422660	Miscellaneous paper and pulp products
422710	Newspaper publishing printing
422720	Print, publishing (except newspaper)

See footnote at end of appendix.

OES census-based industries used in project and corresponding
OES census matrix codes

OES census matrix code	Industry
422810	Industrial chemicals
422840	Drugs and medicines
422870	Agriculture chemicals
422890	Miscellaneous chemicals
422980	Miscellaneous petrol, coal products
423010	Rubber products
423110	Leather tanning, finishing
423180	All other leather products
514000	Railroads, railway express
514210	Trucking services
514440	Water transportation
514500	Air transportation
514700	Transportation services
524810	Telephone (wire and radio)
524820	Telegraph, miscellaneous communication services
524830	Radio broadcasting, television
524910	Electric light and power
524920	Electric, gas, utilities
524930	Gas, steam, supply systems
524940	Water supply
524980	Sanitary services
524970	Other utilities
615010	Motor vehicles and equipment
615020	Drugs, chemicals, allied products
615040	Food and related products
615050	Farm products (raw materials)
615060	Electrical goods
615070	Hardware, plumbing
615080	Machinery, equipment, supplies
615920	Petroleum products
615950	Alcoholic beverages
615960	Paper and paper products
615990	Wholesale, nec
625210	Lumber, building materials
625250	Hardware and farm equipment
625310	Department store, mail order
625340	Vending machine operators
625350	Direct selling
625380	Miscellaneous merchandise stores
625410	Grocery stores
625450	Dairy stores
625490	Food stores, nec
625530	Tire, battery, accessory
625590	Miscellaneous vehicle dealers
625800	Eating and drinking places
706010	Banking
706020	Credit agencies
706070	Stock brokers, investment

See footnote at end of appendix.

APPENDIX 4 — Continued

OES census-based industries used in project and corresponding OES census matrix codes

OES census matrix code	Industry
706300	Insurance
706500	Real estate, real estate law, insurance
807010	Hotels and motels
807040	Lodging places (except hotels)
807310	Advertising
807360	Employment, temporary help
807370	Services (building)
807390	Other miscellaneous business services
807630	Other repair services
807800	Motion pictures, theaters
807940	Miscellaneous entertainment
808060	Hospitals
808090	Health services, nec
808300	Museums, art galleries, zoos
808660	Religious organizations
808670	Welfare services
808690	Nonprofit membership organizations
808910	Engineering and architectural services
808980	Accounting, auditing
808990	Miscellaneous professional services
909120	Postal services
909190	Federal public administration
909300	Local public administration

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[1] nec = not elsewhere classified.

APPENDIX 5

Number of higher education teaching and research faculty in the food and agricultural sciences, 1979, and estimated retirements and average annual openings, 1980-1989[1]

Teaching/research field	Sample response[2]						1980-89 estimated average annual openings (population)[7]
	Fall 1979 employment			Fall 1979 unfilled positions	1980-89 estimated total retirements[5]	1980-89 estimated average annual retirements[6]	
	Total[3]	Female	Minority[4]				
AGRICULTURE							
General agriculture	154	17	48	7	22	2	8
Agricultural economics							
General	846	69	40	68	119	12	66
Agricultural business/management	430	38	16	25	43	4	24
Farm management	89	8	1	9	11	1	8
Agricultural communications	140	38	0	9	20	2	9
Agricultural education/extension	304	30	15	17	66	7	22
Agricultural engineering							
Agricultural engineering science	618	8	24	31	69	7	32
Agricultural mechanization	169	2	4	9	18	2	9
Animal sciences							
General	792	61	33	41	120	12	46
Livestock	283	12	1	8	55	6	14
Dairy production	355	40	10	10	58	6	16
Poultry science	200	15	8	5	32	3	8
Animal breeding	89	16	2	3	15	2	5
Animal health	28	0	1	0	2	0	0
Animal nutrition	234	39	48	7	29	3	9
Animal physiology	99	13	1	1	8	1	2
Entomology	434	60	18	11	22	2	11
Food sciences							
General[8]	711	294	51	40	104	10	43
Dairy processing	34	5	0	0	9	1	1
Food technology	198	43	14	8	31	3	10
Food engineering	32	3	5	1	4	0	1

See footnotes at end of appendix.

APPENDIX 5 — Continued

Number of higher education teaching and research faculty in the food and agricultural sciences, 1979, and estimated retirements and average annual openings, 1980-1989[1]

Teaching/research field	Sample response[2]						1980-89 estimated average annual openings (population)[7]
	Fall 1979 employment			Fall 1979 unfilled positions	1980-89 estimated total retirements[5]	1980-89 estimated average annual retirements[6]	
	Total[3]	Female	Minority[4]				
AGRICULTURE - Continued							
Human nutrition							
Dietetics[9]	413	365	33	90	39	4	70
Food and nutrition[8]	530	377	19	74	55	6	61
Food service systems/ institutional management[9]	138	89	0	14	15	2	13
Human nutritional services[9]	178	149	10	19	10	1	15
Nutrition research[9]	195	115	17	42	24	2	33
International agriculture	54	4	33	3	27	3	6
Plant sciences							
General	458	46	20	16	63	6	20
Agronomy	954	59	29	36	128	13	44
Horticulture							
Fruit and vegetables	537	46	20	37	104	10	41
Landscape architecture	75	16	1	1	7	1	2
Ornamental	372	79	8	9	31	3	11
Plant breeding	235	34	8	3	36	4	8
Integrated pest management	365	33	14	11	49	5	15
Plant pathology	688	99	31	20	108	11	30
Plant physiology	201	48	11	3	21	2	5
Range science	72	4	0	1	9	1	2
Turf management	25	1	0	1	7	1	2
Rural sociology	80	13	3	23	11	1	18
Soil sciences							
General	291	20	57	14	52	5	17
Conservation	73	5	1	6	13	1	6
Fertility/management	108	14	11	3	34	3	6
Chemistry	102	10	6	3	17	2	5
Microbiology	53	8	6	4	3	0	3
Physics	51	10	2	3	4	0	2
Total	12,487	2,455	680	746	1,724	173	779

See footnotes at end of appendix.

APPENDIX 5 — Continued

Number of higher education teaching and research faculty in the food and agricultural sciences, 1979, and estimated retirements and average annual openings, 1980-1989[1]

Teaching/research field	Sample response[2]						1980-89 estimated average annual openings (population)[7]
	Fall 1979 employment			Fall 1979 unfilled positions	1980-89 estimated total retirements[5]	1980-89 estimated average annual retirements[6]	
	Total[3]	Female	Minority[4]				
NATURAL RESOURCES							
General	111	9	0	6	10	1	6
Aquaculture	3	0	0	3	0	0	2
Atmospheric science	22	0	2	0	3	0	0
Fisheries	194	20	5	5	13	1	5
Marine biology	16	3	0	2	4	0	1
Park and recreation management (excluding activities administration)	127	20	2	4	6	1	4
Water resources	24	2	1	5	5	1	5
Wildlife (biology/management)	207	21	1	5	15	2	6
Total	704	75	11	30	56	6	29
FORESTRY[10]							
General	414	24	14	44	66	7	41
Forest engineering	102	4	0	20	6	1	16
Forest management	391	21	11	31	49	5	29
Wood science, technology and industry	253	15	24	18	34	3	17
Silviculture	296	16	3	16	20	2	14
Timber management	161	1	4	1	4	0	1
Urban forestry	11	0	0	4	0	0	3
Other[11]	678	58	9	3	42	4	8
Total	2,306	139	65	137	221	22	129
VETERINARY MEDICINE							
Pre-clinical or basic sciences[12]							
General	133	19	3	9	18	2	9
Anatomy	226	33	12	13	24	2	12
Microbiology	499	95	38	22	60	6	24
Pathology	382	42	13	32	24	2	26

(continued on next page)

See footnotes at end of appendix.

APPENDIX 5 — Continued

Number of higher education teaching and research faculty in the food and agricultural sciences, 1979, and estimated retirements and average annual openings, 1980-1989[1]

Teaching/research field	Sample response[2]						1980-89 estimated average annual openings (population)[7]
	Fall 1979 employment			Fall 1979 unfilled positions	1980-89 estimated total retirements[5]	1980-89 estimated average annual retirements[6]	
	Total[3]	Female	Minority[4]				
VETERINARY MEDICINE - Continued							
Pre-clinical or basic sciences[12]							
Pharmacology	126	26	16	3	8	1	4
Physiology	261	39	24	5	20	2	6
Toxicology	45	7	3	7	4	0	5
Clinical sciences[13]							
Anesthesiology	146	15	0	7	6	1	6
Clinical nutrition	20	3	0	3	1	0	2
Internal medicine	218	31	0	12	15	2	11
Laboratory animal medicine	39	4	0	6	4	0	4
Opthalmology	25	3	0	1	6	1	2
Preventive medicine	53	3	1	8	8	1	7
Radiology	50	11	0	1	0	0	1
Reproductive biology	52	3	4	1	4	0	1
Surgery	140	13	4	7	11	1	6
Other[14]	216	29	4	20	29	3	19
Total	2,631	376	122	157	242	24	145

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[1] Based on 1979-80 Clemson University Survey of U.S. Students and Faculty in Higher Education in Agriculture/Natural Resources, Forestry, Veterinary Medicine, and Home Economics funded by the U.S. Department of Agriculture. Project directors were Dr. Edward L. McLean and Dr. Stephen R. Chapman.

[2] Sample response rates to the Clemson University survey varied among Colleges of Agriculture and Natural Resources (.700), Schools of Forestry (.471), Schools of Veterinary Medicine (.500), and Colleges of Home Economics (.503). For purposes of comparison, all sample data from the Clemson University survey presented for forestry, veterinary medicine, and home economics have been adjusted to represent a 70 percent response rate.

[3] Because of rounding, details may not add to total.

[4] Includes American Indians, Alaskan Natives, Asians, Pacific Islanders, Blacks, and Hispanics.

[5] Total retirements estimated by responding institutions, 1980-89.

[6] Total retirements, 1980-89, estimated by responding institutions and divided by number of years in the period (10).

APPENDIX 5 — Continued

Number of higher education teaching and research faculty in the food and agricultural sciences, 1979, and estimated retirements and average annual openings, 1980-1989[1]

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[7] Extrapolated to represent population of colleges/universities with programs in agriculture, natural resources, forestry, and veterinary medicine. It was assumed that one-half of the reported 1979 unfilled positions represent openings due to an unadjusted chronic shortage of faculty and the remaining one-half represent openings due to turnover, migration, and mobility. Therefore, estimated average annual openings were computed by summing average annual retirements and that half of unfilled positions due to turnover, migration, and mobility. This sum was then extrapolated to represent the total population.

[8] Includes faculty in both Colleges of Agriculture and Colleges of Home Economics.

[9] Includes faculty only in Colleges of Home Economics.

[10] Includes faculty in Schools of Forestry and Colleges of Agriculture.

[11] Most frequently listed specialty titles under "Other" included Forest recreation, Forest wildlife, Fish and wildlife, Forest/wood science, Wildlife management, Range management/science, and Remote sensing.

[12] Includes faculty in Colleges of Agriculture and Schools of Veterinary Medicine.

[13] Includes faculty only in Schools of Veterinary Medicine.

[14] Most frequently listed specialty titles under "Other" included Epidemiology and Public health, Parasitology, Clinical medicine, Clinical pathology, and Virology.

APPENDIX 6

Cooperative Extension Services personnel classified by job title, program area, and sex[1]

Program area and job title	Total personnel	Female personnel	Male personnel
Agriculture and natural resources			
Area agent	507	9	498
County agent	4,022	154	3,868
State specialist	3,287	124	3,163
Supervisor	37	1	36
Total	7,853	288	7,565
Community and regional development			
Area agent	92	6	86
County agent	418	61	357
State specialist	438	54	384
Supervisor	28	2	26
Total	976	123	853
Home economics/ family living			
Area agent	47	44	3
County agent	3,426	3,386	40
State specialist	668	560	108
Supervisor	40	38	2
Total	4,181	4,028	153
4-H youth			
Area agent	37	8	29
County agent	2,759	1,335	1,424
State specialist	399	129	270
Supervisor	34	7	27
Total	3,229	1,479	1,750
Administration			
Area agent	14	0	14
County agent	485	42	443
State specialist	968	188	780
Supervisor	240	61	179
Total	1,707	291	1,416
Unidentified program area			
Area agent	0	0	0
County agent	463	220	243
State specialist	169	27	142
Supervisor	22	7	15
Total	654	254	400
Total	18,600	6,463	12,137

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[1] Source: Science and Education, Cooperative Extension Services master personnel file, May 1981.

APPENDIX 7

Cooperative Extension Services personnel classified by job title, program area, and minority status[1]

Program area and job title	Total personnel[2]	Minority personnel[3]	Nonminority personnel[4]	Unknown[5]
Agriculture and natural resources				
Area agent	494	12	482	13
County agent	3,823	276	3,547	199
State specialist	3,168	89	3,079	119
Supervisor	35	2	33	2
Total	7,520	379	7,141	333
Community and regional development				
Area agent	90	3	87	2
County agent	406	59	347	12
State specialist	408	28	380	30
Supervisor	20	3	17	8
Total	924	93	831	52
Home economics/ family living				
Area agent	45	3	42	2
County agent	3,281	432	2,849	145
State specialist	643	57	586	25
Supervisor	38	2	36	2
Total	4,007	494	3,513	174
4-H youth				
Area agent	37	5	32	0
County agent	2,568	301	2,267	191
State specialist	391	37	354	8
Supervisor	34	1	33	0
Total	3,030	344	2,686	199
Administration				
Area agent	9	2	7	5
County agent	470	13	457	15
State specialist	921	86	835	47
Supervisor	239	18	221	1
Total	1,639	119	1,520	68
Unidentified program area				
Area agent	0	0	0	0
County agent	457	75	382	6
State specialist	166	12	154	3
Supervisor	22	3	19	0
Total	645	90	555	9
Total	17,765	1,519	16,246	835

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[1] Source: Science and Education, Cooperative Extension Services master personnel file, May 1981.

[2] Does not include individuals for whom minority status is unknown.

[3] Includes Black, Spanish surname, American Indian, Alaskan native, Asian, and Pacific Islander personnel.

[4] Includes Non-Spanish Caucasian personnel.

[5] Minority status not included in master personnel file.